

DESCRIPTION

Demonstration circuit 1199A is a 16-Channel Buck Mode LED Driver featuring the LT[®]3595EUHH. The circuit is optimized to drive 16 channels of three series LEDs at 30mA. Each channel has three series white LEDs and they are stuffed on the PCB.

The 16-channel buck mode LED driver features a wide input voltage range, integrated components, externally set LED current, high pwm dimming range, high efficiency, shutdown, open LED protection, and 2MHz switching frequency. The 100mA, 45V fully integrated switches help drive up to 10 LEDs per channel in series at 50mA each. Internal catch diodes reduce external component count and circuit size. PWM dimming is as high as 1000:1 at 100Hz over the entire input voltage range.

There are three input terminals – VIN up to 45V for powering the LEDs, VCC for the control circuitry of the LT3595 and the pwm gates, and μ VIN (6-12V) for the onboard PIC. Although the range of the LT3595 VCC pin goes down to 3V, 5V is needed for PWM signal gates to work properly with the PIC. μ VIN powers the PIC that is on the circuit board in order to show off some preprogrammed patterns and pwm dimming.

There is a large 40-pin jumper J1 that is attached to the pwm pins of the LT3595. If an external source for pwm patterns is desired, it can be attached to this jumper with S1 set to position F (float). This disables the outputs of the pwm gate driver latches.

QUICK START PROCEDURE

Demonstration circuit 1199A is easy to set up to evaluate the performance of the LT3595EUHH. Follow the procedure below:

For higher number of LEDs per string, the LEDs on the board can be removed and a new string can be wired into the anode and cathode connections of the currently-stuffed LEDs. Up to 40V of LEDs can be powered at up to 50mA per string with 45V VIN input to the LT3595. The inductors and capacitors need to be changed to accommodate higher power and current – see the datasheet for details.

Shutdown of the LT3595 is simple. Tie the shutdown terminal to ground and the LEDs will turn off.

This is a buck mode LED driver. The VIN input voltage must be higher than the LED voltage for proper operation. Maximum duty cycle must be accounted for when figuring out how high above VLED the input voltage VIN must be.

The LT3595EUHH datasheet gives a complete description of the part, operation and applications information. The datasheet must be read in conjunction with this Quick Start Guide for demonstration circuit 1199A. The LT3595EUHH is assembled in a 56-pin 5mm x 9mm QFN package with a thermally enhanced ground pad. Proper board layout is essential for maximum thermal performance. See the datasheet section 'Layout Considerations'.

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

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NOTE: Make sure that the VIN terminal DC input voltage does not exceed 45V.

1. Connect $\overline{\text{SHDN}}$ to GND.
2. With power off, connect the 15-45V VIN power supply to the VIN and GND terminals.
3. With power off, connect the 6-12V μ VIN power supply to the μ VIN and GND terminals.

4. With power off, connect the 5V VCC power supply to the VCC and GND terminals.
5. Set S1 to position 0.
6. Turn the power supplies on. Turn VIN on first, then μ VIN, then VCC.
7. Release the $\overline{\text{SHDN}}$ connection to GND.
8. Observe the LEDs OFF with PWM of each channel pulled low.
9. Set S1 to position E (ON).
10. Observe the LEDs ON 100% duty cycle.
11. Use S1 to change the pwm patterns and observe different dimming settings. Set S1 to float and use an external source for the PWM signals on J1 to run the LED strings with your own pattern.
12. Tie $\overline{\text{SHDN}}$ to GND to observe the low quiescent current.

S1 SETTINGS (LED PATTERNS):

- 0:** OFF – all 16 channels
- 1:** Linear gradient
- 2:** Logarithmic gradient
- 3:** Logarithmic scroll
- 4:** 1000:1 100Hz PWM – all 16 channels
- 5:** 100:1 1kHz PWM – all 16 channels
- 6:** Fade from 0 to 1 in 1000:1 increments 100Hz PWM
- 7-D:** *No program*
- E:** ON – all 16 channels
- F:** FLOAT – drive PWM pins by external source on J1

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1199A

16-CHANNEL BUCK MODE LED DRIVER DIMMING

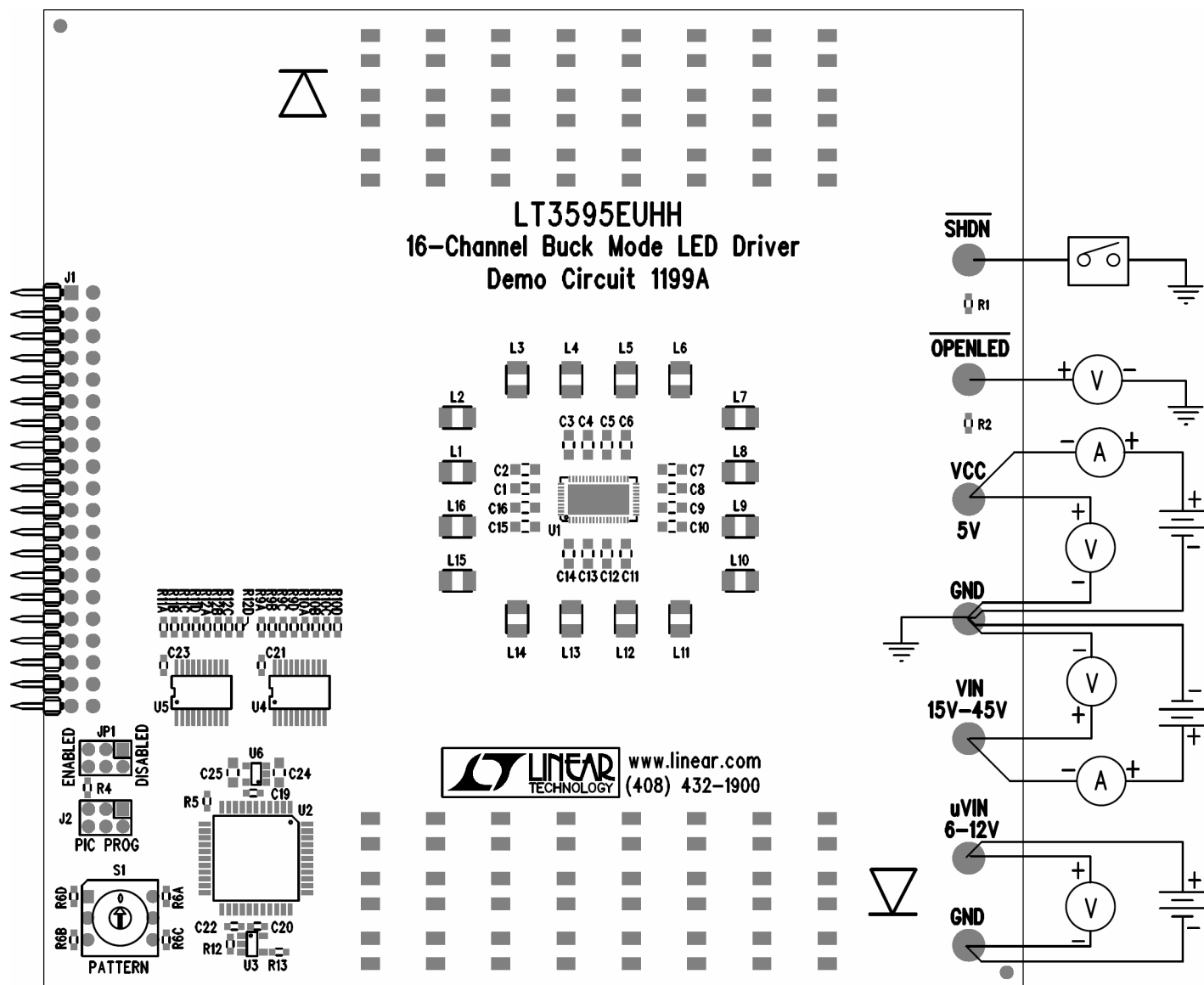
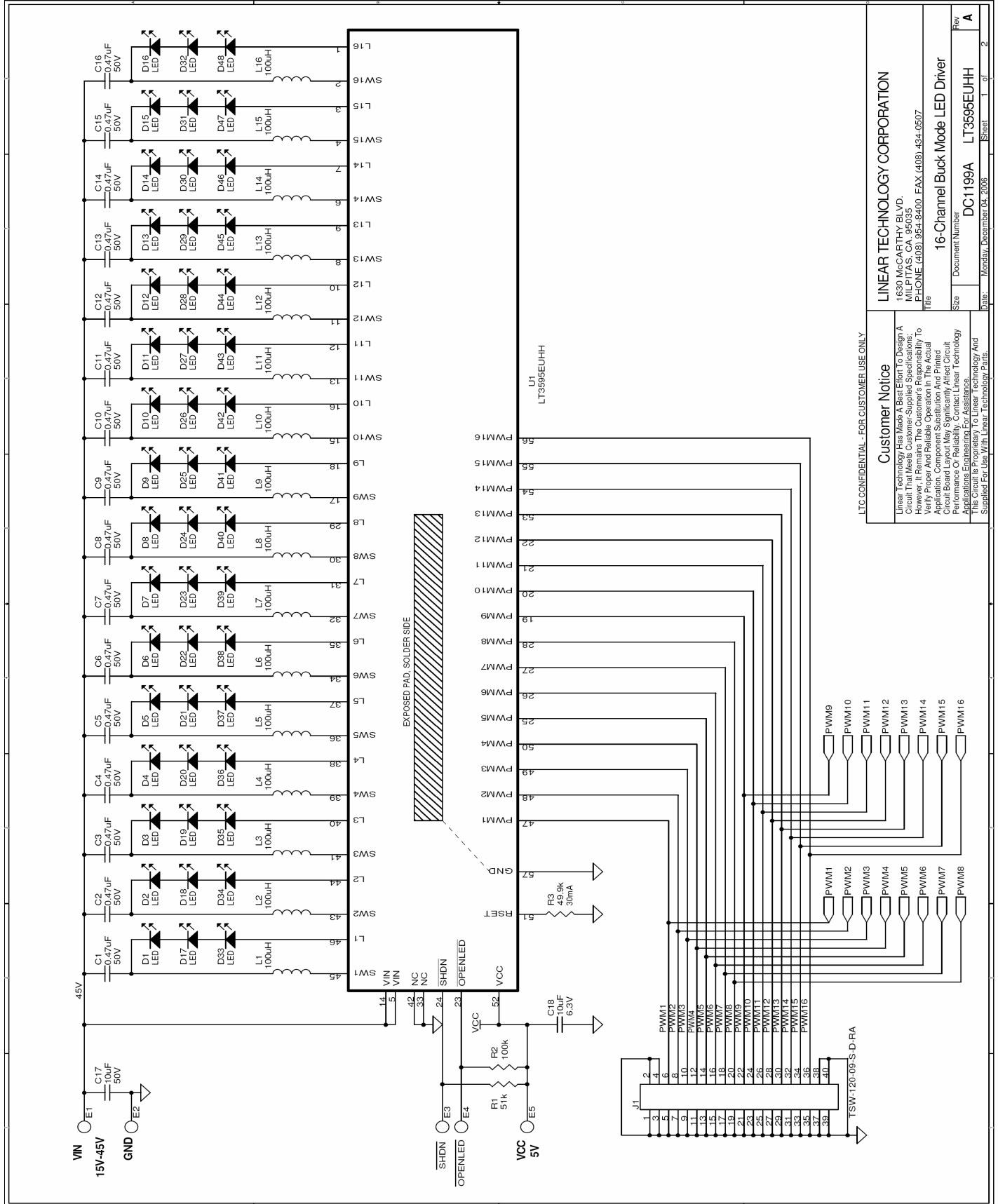


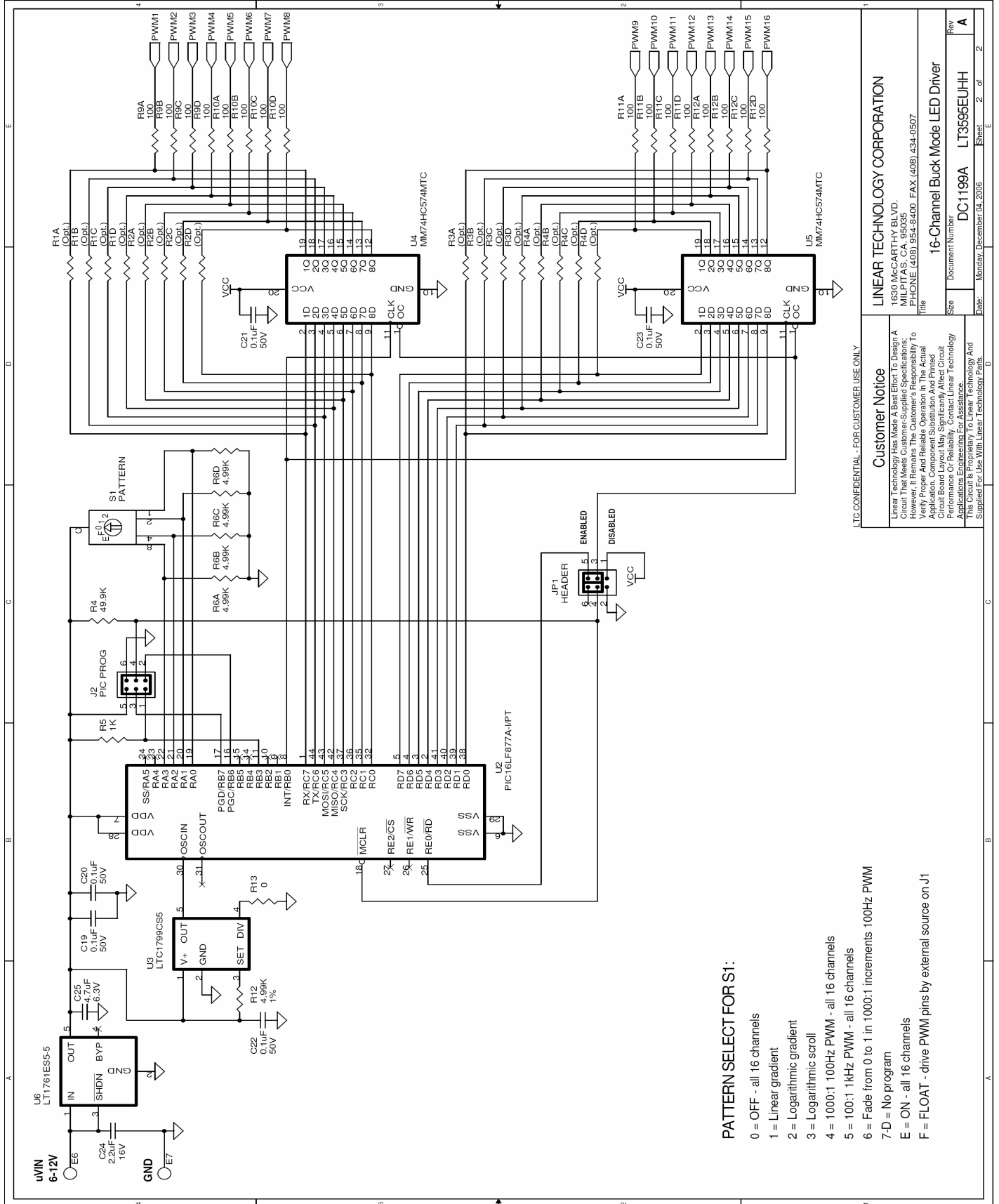
Figure 1. Test procedure setup drawing for DC1199A

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16-CHANNEL BUCK MODE LED DRIVER DIMMING



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