

ANALOG DEVICES DC1019A Radio Magic User Guide

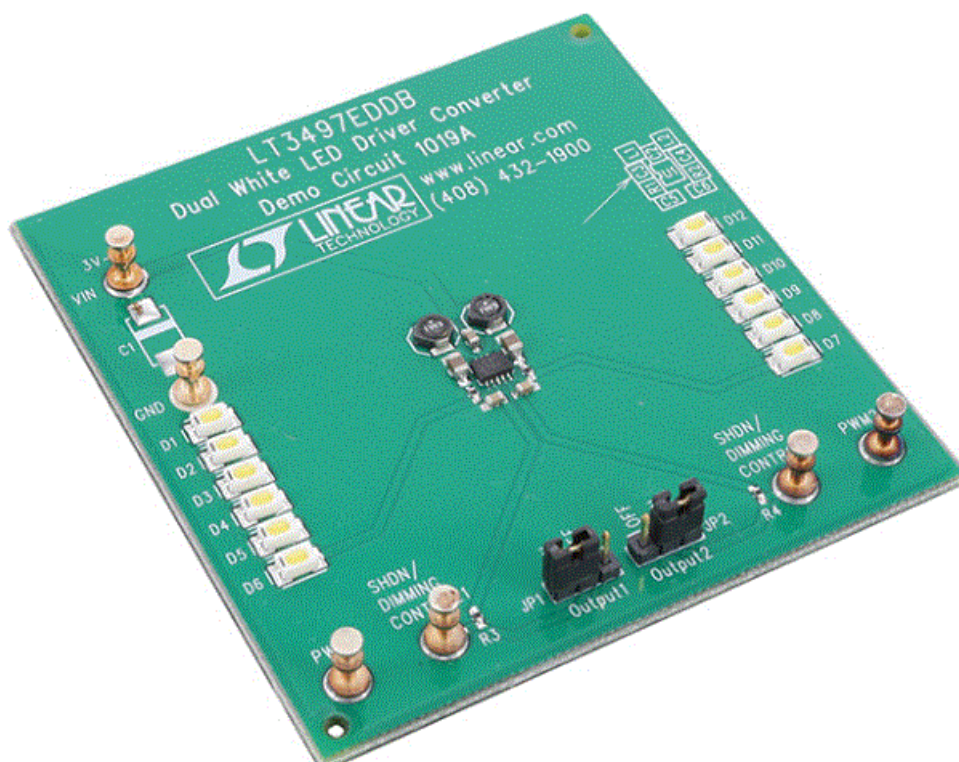
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ANALOG DEVICES DC1019A Radio Magic



Product Information

The LT3497EDDB is a dual white LED driver converter designed for driving two strings of white LEDs. It features analog dimming control and high-side current sensing. The circuit is capable of producing bright light, so caution should be taken to avoid looking directly at the operating LED, as it can damage the eyes. The LT3497 datasheet provides a complete description of the part, its operation, and application information. It should be read in conjunction with this quick start guide when working on or modifying the demo circuit 1019A. The input supply range for the demo circuit is limited by the maximum input voltage of the LT3497. Always ensure that the input voltage does not exceed 10V to prevent any damage to the circuit.

Product Usage Instructions

1. Set up the measurement equipment according to Figure 1.
2. Place jumpers in the following positions: JP1 ON, JP2 ON.
3. Ensure that the power is off, then connect the input power supply to VIN and GND.
4. Turn on the power at the input, making sure that the input voltage does not exceed 10V.
5. Check for proper voltages and currents. If the LEDs do not light up, verify the jumper settings.
6. Once proper operations are established, adjust the input within the operating range and observe the parameters of interest.
7. To test filtered PWM dimming or direct DC dimming, remove jumper JP1 or JP2, apply PWM or DC signal to SHDN/DIMMING CTRL1 or SHDN/DIMMING CTRL2, and observe the brightness of the LED output.
8. For direct PWM dimming, refer to the Direct PWM Dimming section in the datasheet.

Refer to Figure 2 for proper technique when measuring input or output ripple.

DESCRIPTION

WARNING! Do not look directly at the operating LED.
This circuit produces light that can damage the eyes.

Demonstration circuit 1019A is a Dual White LED Driver Converter featuring the LT3497 in a 3mm x 2mm DFN package. The demo circuit demonstrates a small size and low component count in two independent Boost Circuits. It drives two independent LED strings at 20mA from a 3V-10V input. Other features of the LT3497, such as the internal Schottky di-odes, the high switching frequency, and the internal open circuit protection, allow the use of tiny components. Different dimming controls can be implemented on the demo board. Optional N-MOSFET placeholders are provided to test direct PWM dimming. Analog dimming is done via the SHDN/DIMMING CONTROL terminals. Please refer to the quick start procedure. The high side current sensing feature of the LT3497 allows a “one wire” current source, i.e. the low side of the LED string can return to ground anywhere. The LT3497 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 working on or modifying the demo circuit 1019A.

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

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Table 1. Performance Summary (TA = 25°C)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
VIN	Input Supply Range **		3		10	V
IOUT	Output Current		19	20	21	mA
VOUT	Output Voltage			19.5		V
h	Efficiency	V _{IN} =3.6V		72.3		%
VOPEN	CAP pin Over voltage Protection	LED Open	30	32	34	V
I _Q	Quiescent Current	V _{IN} = 4.2V, CTRL=ON, LEDs open			15	mA
IQSHDN	Quiescent Current in Shutdown	V _{IN} = 4.2V, CTRL=OFF			10	μA
Fs	Switching Frequency		1.8	2.3	2.8	MHz

** The Input Supply Range of the Demo Circuit 1019A is limited by the Maximum Input Voltage of the LT3497. Always ensure that this level is not exceeded.

QUICK START PROCEDURE

Demonstration circuit 1019A is easy to set up to evaluate the performance of the LT3497. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

Note: when measuring the input or output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the input or output voltage ripple by touching the probe tip directly across the Vin or Vout and GND terminals. See Figure 2 for the proper scope probe technique.

1. Place jumpers in the following positions to test the circuit:

ON

ON

2. With power off, connect the input power supply to VIN and GND.
3. Turn on the power at the input.

Note: Make sure that the input voltage does not exceed 10V.

4. Check for the proper voltages and currents.

Note: If the LEDs do not light up, check the jumper settings.

5. Once the proper operations are established, adjust the input within the operating range and observe the parameters of interest.
6. To test the filtered PWM dimming or the direct DC dimming, remove the jumper JP1 or JP2, apply the PWM or the DC signal to the SHDN/DIMMING CTRL1 or SHDN/DIMMING CTRL2 and observe the brightness of the LED output.
7. To test the direct PWM dimming, follow the Direct PWM Dimming section in the datasheet.

