

# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 459

## MICROPOWER STEP-DOWN SWITCHING REGULATOR IN THINSOT

### LT1946EMS8 / LT1946AEMS8E

## DESCRIPTION

Demonstration circuit 459 features the LT1946 and LT1946A boost DC/DC converter with 1.5A switch and built in soft-start. There are two switching regulator circuits in DC459, the 12V output boost converter (upper circuit) uses 1.2MHz fixed frequency LT1946 in MS8E package. The circuit is designed to convert 5V input to 12V output at 400mA of load current.

The triple output TFT LCD bias supply (lower circuit) uses 2.7MHz LT1946A in thermally enhanced MS8E package. The

circuit is designed to convert 3.3V input to 8V at 350mA, 23V at 5mA, and -8V at 10mA TFT LCD bias outputs.

Each circuit has a jumper for testing SHDN mode operation. Placing the jumper (JP1 & JP2) to "ON" enables LT1946 boost converter operation and placing the jumper to "OFF" disables LT1946 and the circuit will turn off.

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

**Table 1. Performance Summary**

PARAMETER	CONDITION	VALUE
Minimum Input Voltage	12V output	5V
	TFT LCD BIAS supply output	3.3V
Maximum Output Current	12V output	400mA
	TFT LCD BIAS supply	350mA (8V), 10mA (-8V), 5mA (23V)
V <sub>OUT REG</sub>	12V output	≅ 300mV
	TFT LCD BIAS supply (8V)	≅ 50mV

## QUICK START PROCEDURE

### 12V OUTPUT, UPPER CIRCUIT (BOOST CONVERTER)

Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Connect the input power supply (set at 5V) to **Vin1** and **GND** pins.
2. Turn on the input power supply and observe the output voltage, the output voltage should read  $12V \pm 0.3V$ .
3. Turn on the load, preset at **400mA**. The input current should read approximately  $\cong 1100mA$  and the output voltage should be  $12V \pm 0.3V$ .
4. Check the output ripple using the oscilloscope (see Figure 2). The output ripple should not be higher than 70mV. Also check the switching frequency, it should be  $\cong 900nS$ .

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### **TFT LCD BIAS SUPPLY, LOWER CIRCUIT (BOOST CONVERTER)**

Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Connect the input power supply (set at 3.3V) to the **Vin2** and **GND** pins.
2. Turn on the input power supply. The output voltages should read  $8V \pm 0.05V$ ,  $-8V \pm 0.5V$ ,  $23V \pm 5V$ .
3. Turn on the load box preset at **350mA for 8V, 5mA for 23V, and 10mA for -8V**. The input current should read around  $\cong 1300mA$  and the output voltage should now read  $8V \pm 0.05V$ ,  $24V \pm 2V$ ,  $-7.5V \pm 0.5V$ .
4. Check the output ripples using the oscilloscope (see Figure 2). The output ripple should be  $\cong 10mV$  for 8V,  $\cong 10mV$  for 23V, and  $\cong 10mV$  for -8V. Also check the switching frequencies using the 8V ripple, it should be 400nS.