

# .38 Watt LCD Single DC/DC Converter



## Features

- 5 Volt Input
- Positive or Negative LCD Bias Output
- Simple 4 Terminal Operation
- Low Cost
- Small Sealed SIP Package
- 5 Year Warranty
- RoHS Compliant

## Description

The Model 5S25.030LCD DC/DC converter provides a low cost way to derive the bias voltage for LCD displays in systems where only 5 volt digital voltage is available.

The LCD model converts 5 volt inputs to an isolated 25 volts DC at up to 750 milliwatts of power. The simple 4 terminal operation allows for quick system design.

The isolated output allows the LCD converter to be connected in either a positive output mode for color displays or as a negative bias for monochrome displays.

The LCD is packaged in an environmentally rugged plastic case. The use of special potting compounds allows the converters to be water washed and operate over the full -40° to 85°C industrial temperature range.

### RoHS Compliant:

RoHS Compliance means conformity to EU Directive 2002/95/EC of 27 January 2003, on the restriction of the use of certain hazardous substances in electrical and electronic equipment, lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers are not present in quantities exceeding the following maximum concentrations in any homogeneous material, except for applicable exemptions.

0.1% (by weight of homogeneous material) lead, mercury, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers, or 0.01% (by weight of homogeneous material) cadmium. The RoHS marking is as follows:



Model	Input Range VDC			Output	
	Min	Nom	Max	VDC	mA
5S25.030LCD	4.5	5.0	5.5	25	30

Load Regulation, 25% to 100% Load	25% Typical
Line Regulation	1.3% / % VIN Typical
Efficiency	60% Typical
Operating Temperature Range (Case)	-40° to 85°C

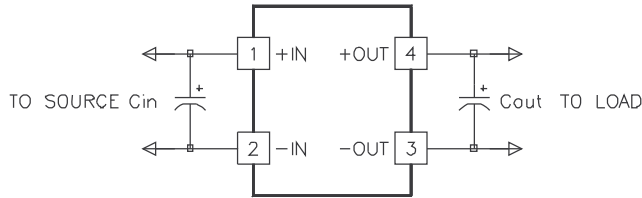
Specifications subject to change without notice.

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## Applications Information

### Connecting To Your System

Figure 1 shows the input and output connections for the LCD series of converters. The output should be bypassed with at least a 4.7  $\mu\text{F}$  tantalum capacitor. For lower noise operation, especially at low temperatures this value may be increased to 10 or 20  $\mu\text{F}$  as required.



**Figure 1.**

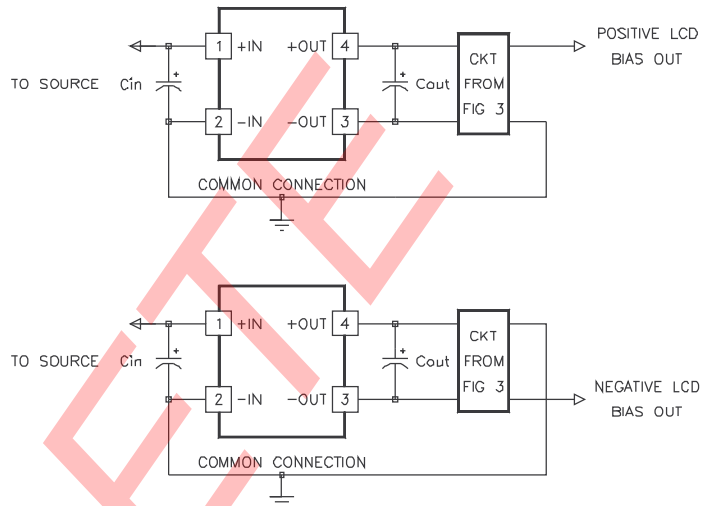
The output of the LCD model should be bypassed with a 4.7 to 20  $\mu\text{F}$  tantalum. The input may need to be bypassed if the converter is more than 1 to 2 inches from the input source or if the source impedance is high.

The input should be bypassed if it is more than about 1 or 2 inches from the input supply or if the input source impedance is large. A 1 to 20  $\mu\text{F}$  tantalum works well for the input bypass.

For a positive LCD Bias voltage connect pin 3 to pin 2 and take the positive bias voltage from pin 4. For a negative bias voltage connect pin 4 to pin 2 and take the negative bias voltage from pin 3. These connections are shown in figure 2.

### NOTE

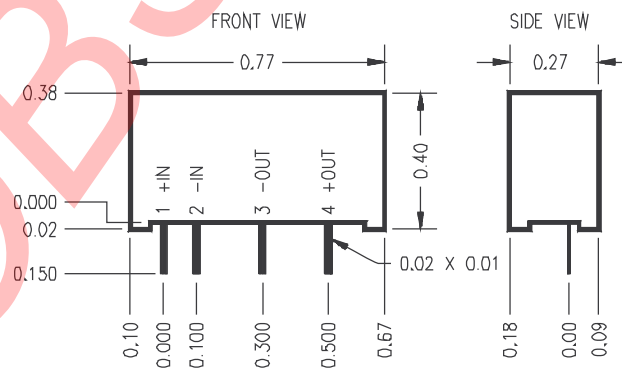
- (1) Water Washability - Calex DC/DC converters are designed to withstand most solder/wash processes. Careful attention should be used when assessing the applicability in your specific manufacturing process. Converters are not hermetically sealed.



**Figure 2.**

The LCD series may be connected to supply either a positive or negative LCD bias voltage as shown.

### Pin Out



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## Generating Adjustable Bias Voltages

Most LCD Applications require an adjustable LCD bias voltage. Since every system has different requirements for adjustability and power level, several typical circuits are given. These circuits although shown with trimpot adjustment, may be easily adapted to digital control by connecting a D/A converter output to the bottom of the divider resistors. This will allow

direct digital control of the LCD bias voltage. The basic circuits shown work for either positive or negative bias voltages. Due to the fact that the LCD series converters are isolated from the input circuits they can't "tell" how they are hooked up. As long as the load current flows from out of the +output to the -output, what is called ground is arbitrary.

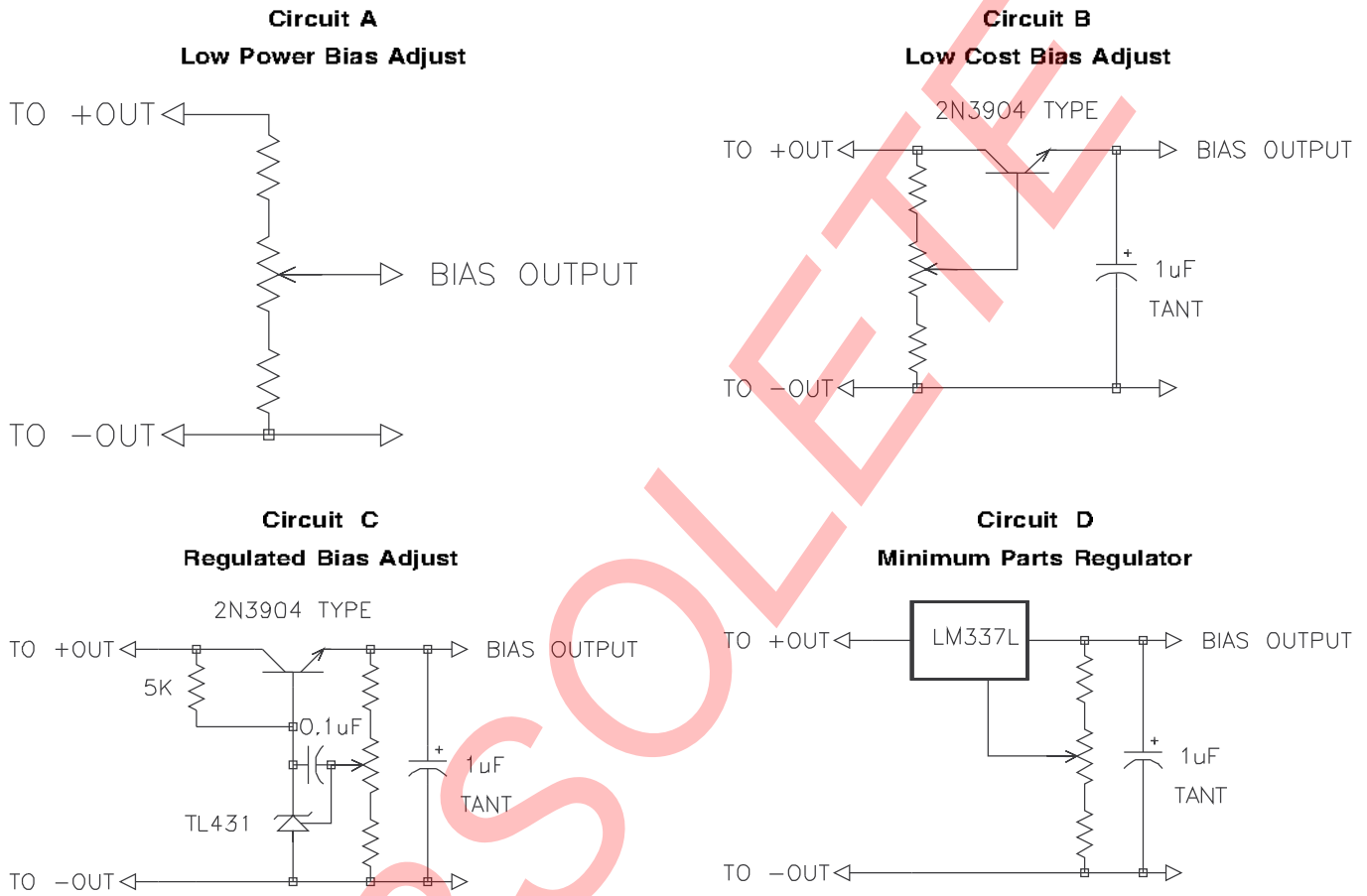


Figure 3.

Circuits A-D show several increasingly accurate methods for controlling the LCD Bias voltage as may be required for your specific display. In all cases the divider resistors and trimpot should be selected to give the proper range of output voltage as required by your circuit. These circuits may be used for positive or negative LCD bias adjustments as required. Just insert the circuits shown between the LCD output and any ground connections as shown in figure 2.