



## Consumer Appliance, Widget, Gadget

### SPF Monitor

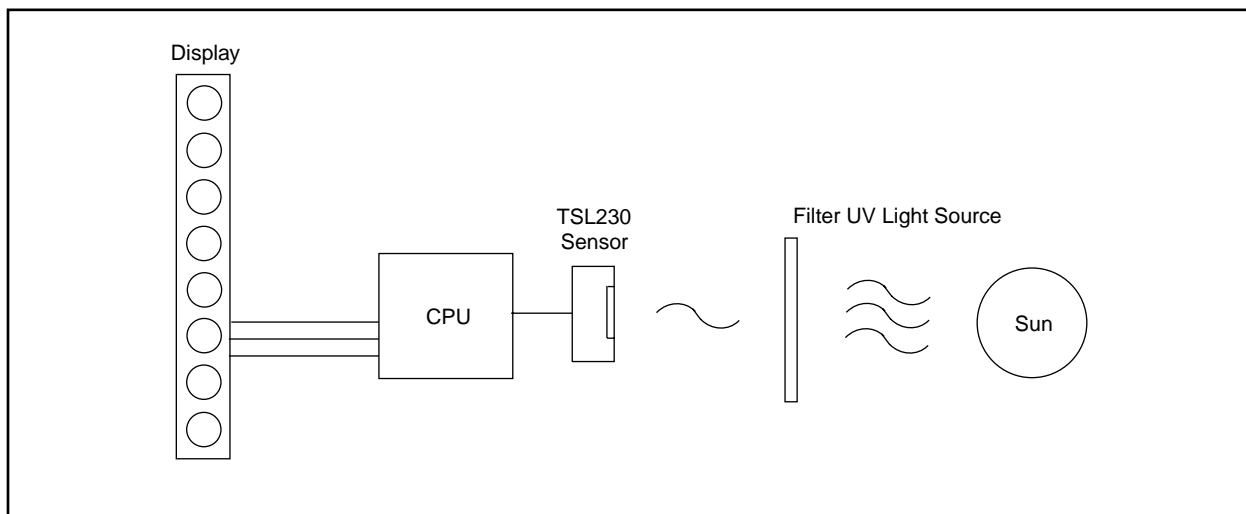
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#### INTRODUCTION:

With the growing health concerns of ultraviolet exposure, this application's intent is to suggest a UV monitor based on the PIC12C508. This discussion does not cover calibration and actual commercially related suggested SPF values. The PIC12C508 must be programmed with the correct values based on more extensive testing to produce an actual product.

Using a Texas Instruments TSL230 as a light sensor, a PIC12C508 to manipulate the information provided by the TSL230 and a 74LS138 3 line to 8 line decoder tied to some LED's, we can construct a UV monitor. This monitor can read the current UV level and indicate on an LED display the suggested minimum SPF value for safe exposure to the sun. Note that a filter is required to be placed between the sensor and the light source. This filter should be able to filter most of the visible and infra-red portions of the spectrum.

#### Block Diagram:



#### APPLICATION OPERATION:

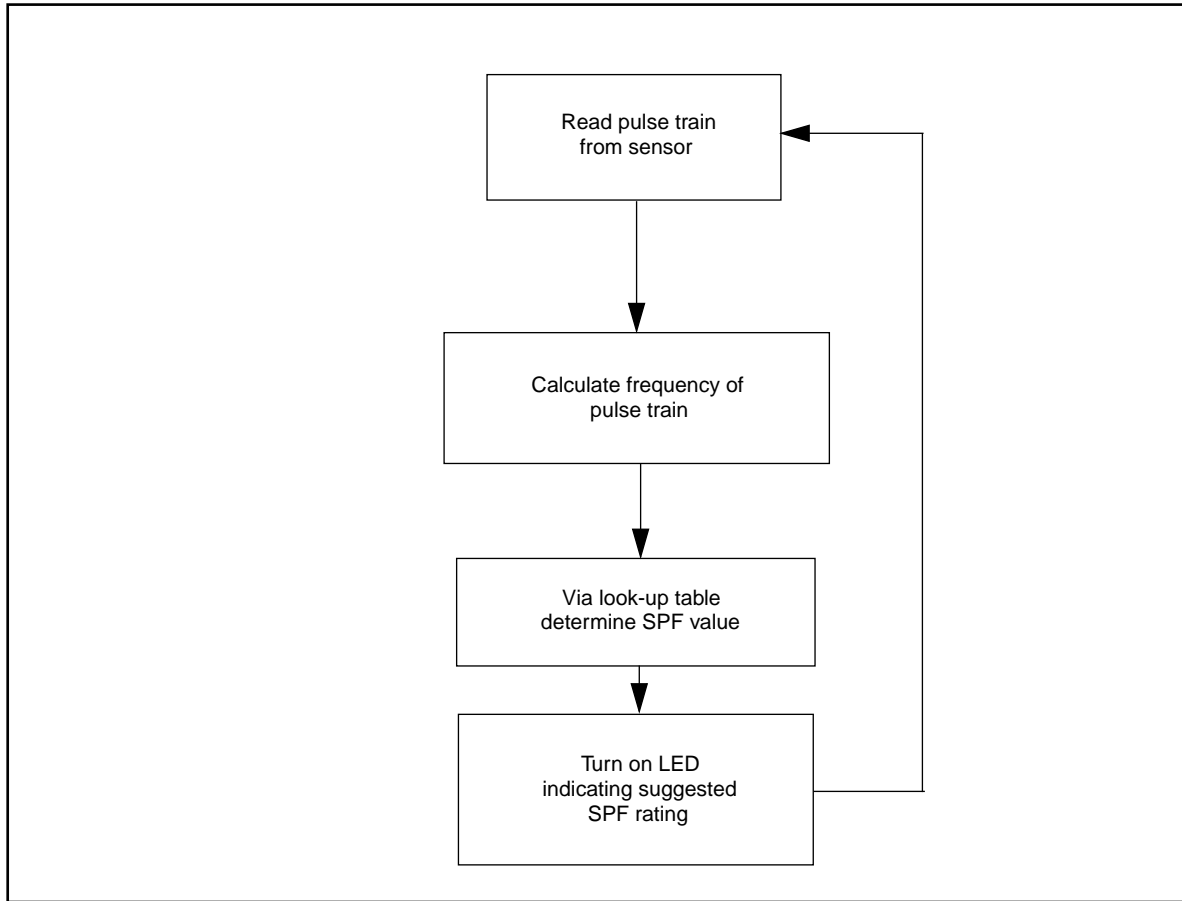
An ultraviolet radiation source (in this case the sun) passes through a filter on its way to the TSL230 light sensor. The TSL230 is mainly sensitive to the spectrum from just below 300 nm to 1100 nm. The portion of the UV spectrum that is biologically damaging is from 290 to 340 nanometers. This is the lower region of sensitivity for the sensor so we must use a filter to remove the visible and infra-red portions of the spectrum. The TSL230 is a light to frequency type sensor. The pulse train provided by the TSL230 in response to the current UV level is sent to the 12C508. The 12C508 can then determine the counts per second and via a pre-calculated look-up table turn on the appropriate binary data pins to a 74LS138 to display the suggested SPF on the 8 LED's.

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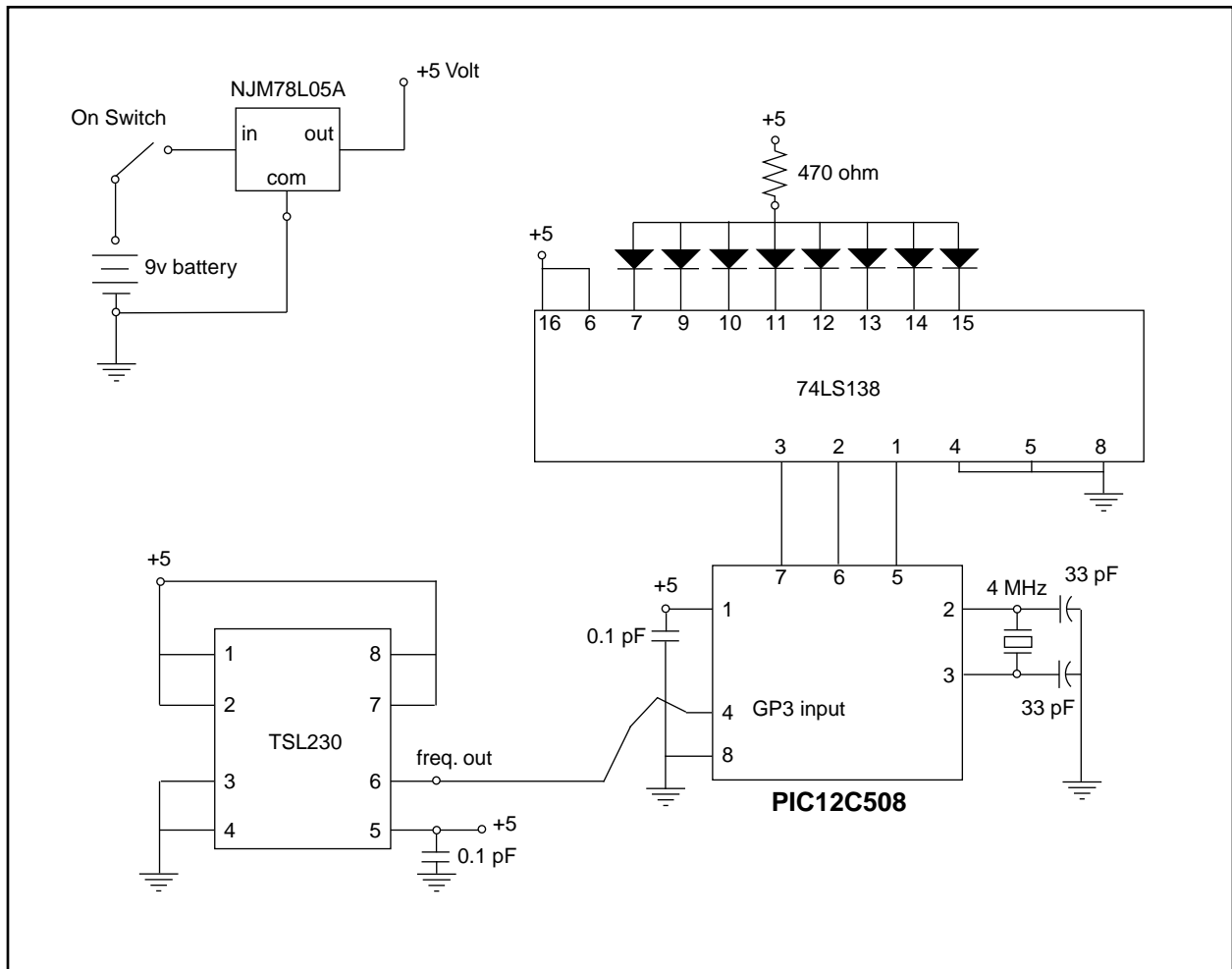
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Flow Chart:



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Graphical hardware representation:



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NOTES: