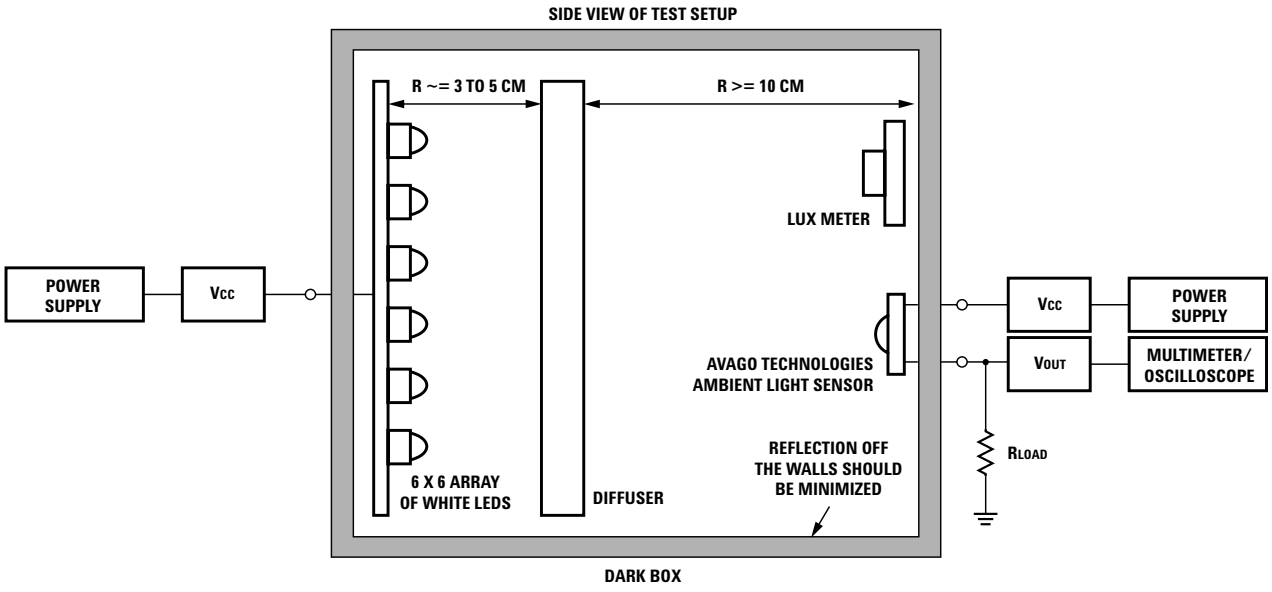
Test Setup for Ambient Light Sensor Testing

Application Report

Introduction

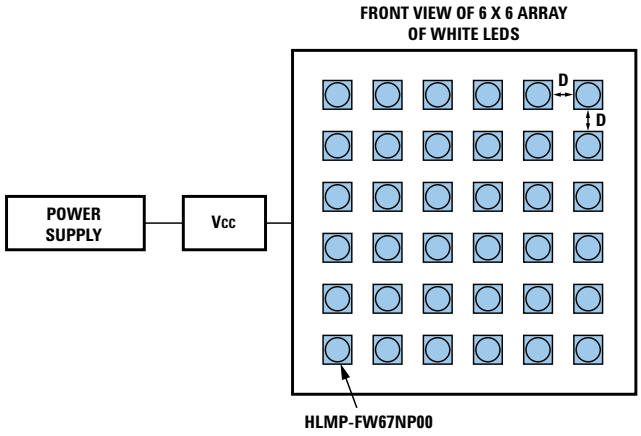
This document provides a general recommendation for testing the functionality of the ambient light sensor. It covers the measurement equipment and techniques for determining the output voltage (Vout) of the ambient light sensor.

Proposed Test Setup



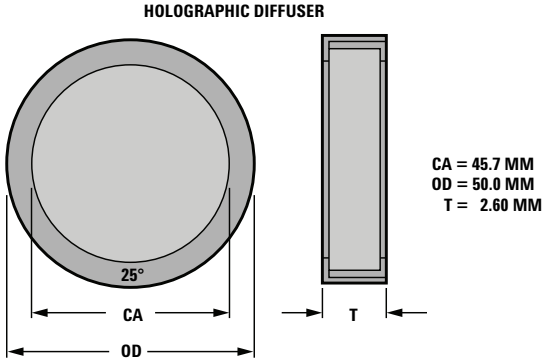
1. Required Equipment
   - A DC power supply of up to 12 V is recommended to be used to power up the array of LEDs to provide a lux level of up to 1000 lux.
   - A DC power supply of up to 6 V can be used to power up the sensor.
   - A multimeter or an oscilloscope can be used to measure the output voltage of the sensor.
2. Dark Box
   - The material of the dark box is recommended to be black in color so that significant reflection off the walls of the box is reduced.

3. 6 x 6 Array of White LEDs



- The LEDs used are recommended to have a wide viewing angle so that the light will be more uniform across angle.
- LEDs with a high light intensity are preferred as the diffuser may cause a significant attenuation of the light.
- The LEDs are recommended to be placed in close proximity to each other to allow for a more uniform light distribution across angle. In other words, the distance, D should be as small as possible.
- Example of the recommended LEDs is extra bright flat top white LED lamp from Avago Technologies (Part no: HLMP-FW67NP00). It has a viewing angle of 85° and a minimum intensity of 680 mcd at 20 mA.
- The power supply to the LEDs can be varied to obtain the required lux value for measurement as measured by the lux meter.

4. Diffuser



- Typically, a better diffusion is obtained at the expense of a higher attenuation of the light source.
- Example of the recommended diffuser is a 30°, 50 mm diameter holographic diffuser from Edmund Optics (Part No: 54501). The material of this diffuser is polycarbonate with a transmission efficiency of >85% and it has a spectral range from 365 nm to 1600 nm.

5. Lux Meter

- The equipment for lux measurement is a lux meter.
- Example of the recommended model is Illuminance Meter T-10 and T-10M receptor unit from Konica Minolta.

6. Avago Ambient Light Sensor
   - The exact Vcc to be used depend on the design of the customer application and the recommended operating Vcc of the ambient light sensor.
   - The output voltage of the ambient light sensor, at the lux level that was set, can be measured with a multimeter or an oscilloscope.
7. It is also recommended that regular calibrating of the white LED light source is carried out to ensure that the light received by both the lux meter and the ambient light sensor is uniform.

AV01-0224EN June 19, 2006