

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

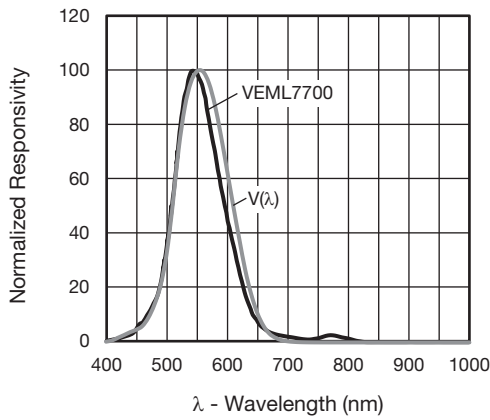


Fig. 2 - Spectral Response

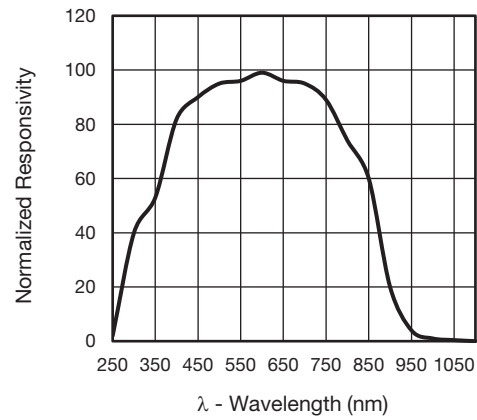


Fig. 3 - White Channel Sensitivity Spectrum

ALS sensitivity spectrum close to human eye photopic curve $v(\lambda)$. Human eye curve adaption achieved by Filtron™ technology.

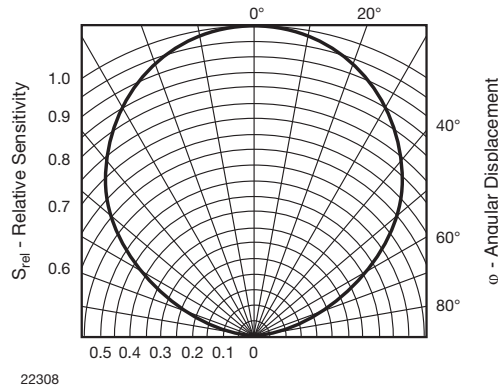


Fig. 4 - Relative Radiant Sensitivity vs. Angular Displacement

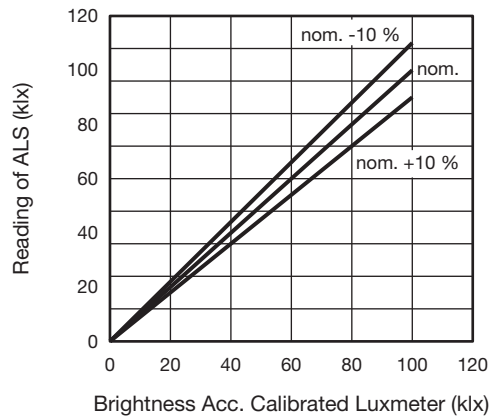


Fig. 5 - ALS measurement deviation between different light sources: $\leq 10\%$

APPLICATION INFORMATION

VEML7700 is a cost effective solution of ambient light sensor with I²C bus interface. The standard serial digital interface is easy to access “Ambient Light Signal” without complex calculation and programming by external controller.

1. Application Circuit

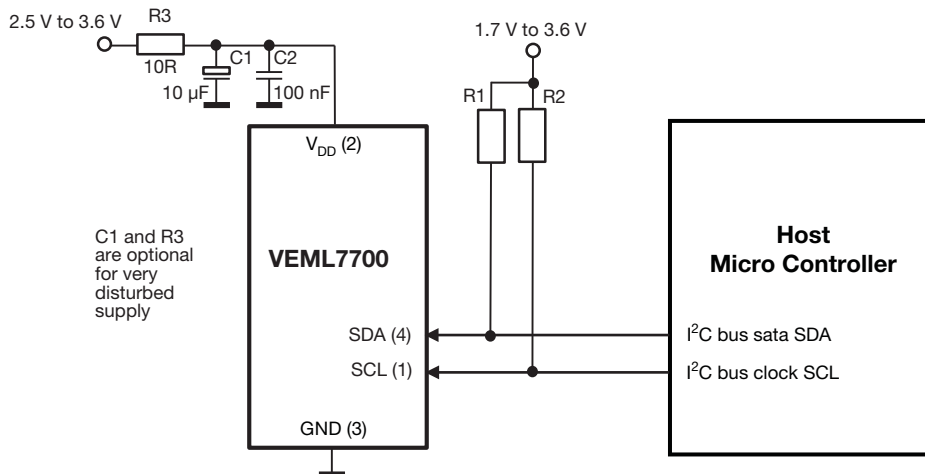


Fig. 6 - Application Diagram

Notes

- Proposed values for the pull-up resistor R1 and R2 should be > 1 kΩ, e.g. 2.2 kΩ to 4.7 kΩ.

For detailed description about set-up and use as well as more application related information see AN: “Designing VEML7700 into an Application”.

2. I²C Interface

The VEML7700 contains actual six 16 bit command codes for operation control, parameter setup, and result buffering. All registers are accessible via I²C communication. Figure 7 shows the basic I²C communication with VEML7700.

The built in I²C interface is compatible with I²C modes “standard” and “fast”: 10 kHz to 400 kHz.

I²C H-level range = 1.3 V to 3.6 V.

Please refer to the I²C specification from NXP for details.

Send byte Write command to VEML7700

S	Slave address	Wr	A	Command code	A	Data byte (LSB)	A	Data byte (MSB)	A	P
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Receive byte Read data from VEML7700

S	Slave address	Wr	A	Command code	A	S	Slave address	Rd	A	Data byte (LSB)	A	Data byte (MSB)	N	P
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S = start condition Host action
P = stop condition
A = acknowledge VEML7700 response
N = no acknowledge

Fig. 7 - Send Byte / Receive Byte Protocol

Register Addresses

VEML7700 has actual six user accessible 16 bit command codes.

The addresses are 00h to 06h (03h not defined / reserved).

Device Address

The VEML7700 has a fix slave address for the host programming and accessing selection.

The slave address (7 bit) is set to 0010000 = 0x10.

The least significant bit (LSB) defines read or write mode.

According 8 bit the bus address is then 0010 0000 = 20h for write and 0010 0001 = 21h for read.

Auto-Memorization

VEML7700 can memorize the last ambient data before shutdown and keep this data before waking up.

When VEML7700 is in shutdown mode, the host can freely read this data via read command directly.

When VEML7700 wakes up, the data will be refreshed by new detection.