

TCS3701

ALS/Color and Proximity Sensor for Use Behind OLED Displays

General Description

The TCS3701 features ambient light and color (RGB) sensing in parallel with proximity detection. The device comes in a low-profile and small footprint, L2.5mm x W2.0mm x H0.5mm package.

The Ambient Light and Color Sensing function provides five concurrent ambient light sensing channels: Red, Green, Blue, Clear, and Wideband. The RGB and Clear channels have a UV/IR blocking filter. This architecture accurately measures ambient light and enables the calculation of illuminance, chromaticity, and color temperature to manage display appearance.

The Proximity function synchronizes IR emission and detection to sense nearby objects. The internal IR LED driver needs to be connected to an external emitter. The architecture of the engine features self-maximizing dynamic range, ambient light subtraction, advanced crosstalk cancelation, 14-bit data output and interrupt-driven I²C communication. Sensitivity, power consumption, and noise can be optimized with adjustable IR LED timing and power. The proximity engine recognizes detect/release events and produces a configurable interrupt whenever the proximity result crosses upper or lower threshold settings.

Key Benefits & Features

The benefits and features of TCS3701 are listed below:

Figure 1:
Added Value of Using TCS3701

| Benefits | Features |
|--|--|
| <ul style="list-style-type: none"> Invisible ALS and color sensing under any glass type | <ul style="list-style-type: none"> Configurable, high sensitivity <ul style="list-style-type: none"> Programmable gain and integration time 1024x dynamic range by gain adjustment only 1mlux minimum detectable illuminance (100ms) Tailored ALS and color response <ul style="list-style-type: none"> UV/IR blocking filter for RGBC channels Wideband reference channel without filters ALS/color interrupt with thresholds |
| <ul style="list-style-type: none"> Invisible proximity detection behind OLED displays | <ul style="list-style-type: none"> Capable to drive external IR emitter LED or VCSEL Crosstalk and threshold calibration on chip Programmable timings and sensitivity Calibrated LED output power |
| <ul style="list-style-type: none"> Low power consumption and minimum I²C traffic | <ul style="list-style-type: none"> 1.8V_{DD} operation Configurable sleep mode Interrupt-driven device On-chip self-calibration of ALS and proximity functions |
| <ul style="list-style-type: none"> Integrated status checking for all functions | <ul style="list-style-type: none"> Digital and analog ALS saturation flags Proximity saturation flag |

Applications

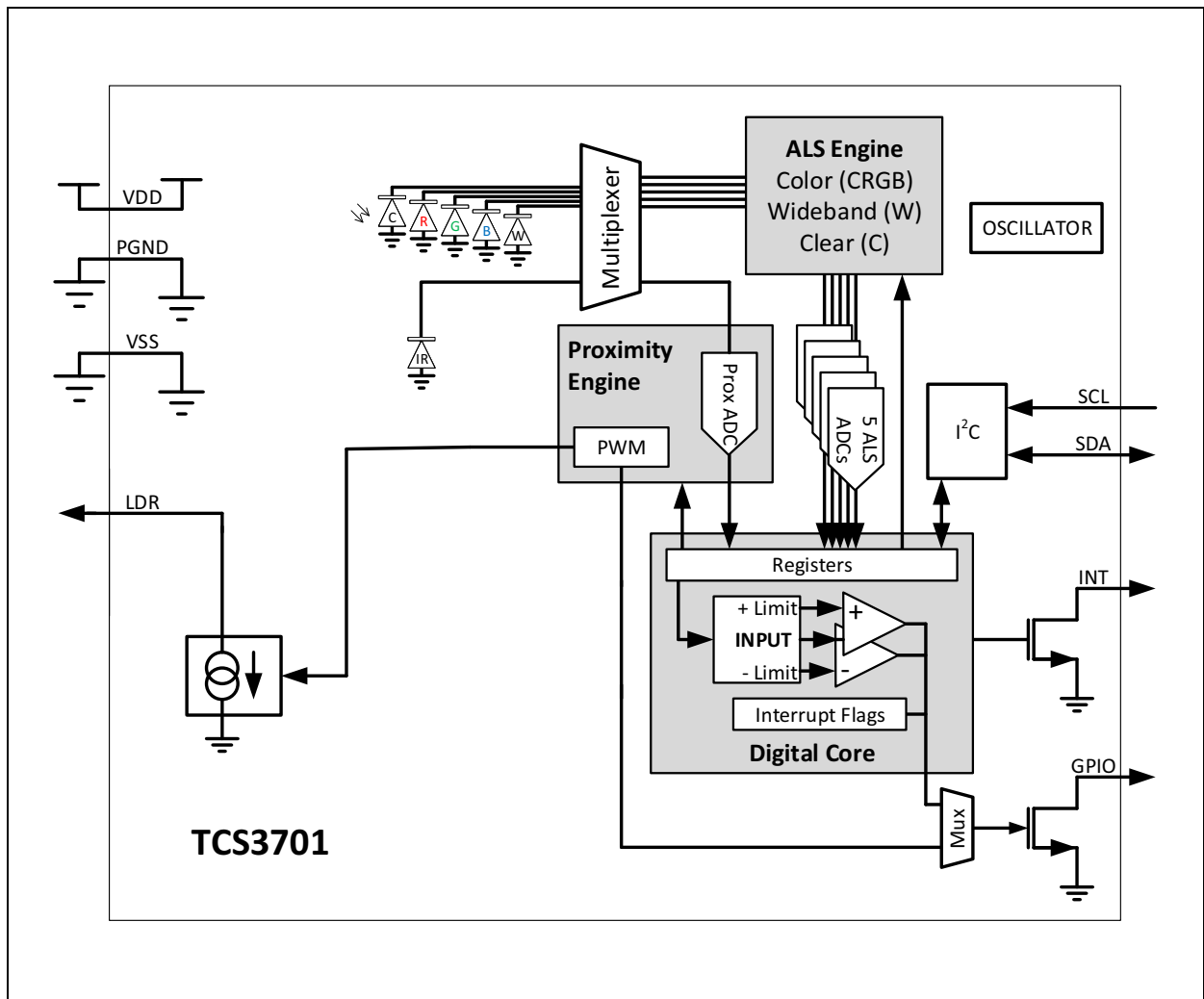
TCS3701 integrates multiple applications within one device. The applications for TCS3701 include:

- Brightness management for displays
- Color management for displays
- Proximity detection
- Touch screen disable

Block Diagram

The functional blocks of this device are shown below:

Figure 2:
Functional Blocks of TCS3701



Copyrights & Disclaimer

Copyright ams AG, Tobelbader Strasse 30, 8141 Premstaetten, Austria-Europe. Trademarks Registered. All rights reserved. The material herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner.

Devices sold by ams AG are covered by the warranty and patent indemnification provisions appearing in its General Terms of Trade. ams AG makes no warranty, express, statutory, implied, or by description regarding the information set forth herein. ams AG reserves the right to change specifications and prices at any time and without notice. Therefore, prior to designing this product into a system, it is necessary to check with ams AG for current information. This product is intended for use in commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment are specifically not recommended without additional processing by ams AG for each application. This product is provided by ams AG "AS IS" and any express or implied warranties, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose are disclaimed.

ams AG shall not be liable to recipient or any third party for any damages, including but not limited to personal injury, property damage, loss of profits, loss of use, interruption of business or indirect, special, incidental or consequential damages, of any kind, in connection with or arising out of the furnishing, performance or use of the technical data herein. No obligation or liability to recipient or any third party shall arise or flow out of ams AG rendering of technical or other services.

Contact Information

Buy our products or get free samples online at:

www.ams.com/Products

Technical Support is available at:

www.ams.com/Technical-Support

Provide feedback about this document at:

www.ams.com/Document-Feedback

For further information and requests, e-mail us at:

ams_sales@ams.com

For sales offices, distributors and representatives, please visit:

www.ams.com/Contact

Headquarters

ams AG
Tobelbader Strasse 30
8141 Premstaetten
Austria, Europe

Tel: +43 (0) 3136 500 0

Website: www.ams.com