

TCS3410

Universal Ambient Light RGB Sensor with Selective Flicker Detection for Use Behind OLED Displays or Auxiliary to Camera

General Description

The TCS3410 features ambient light sensing, as well as flicker detection. The device comes in a low-profile and small footprint, L2.0mm x W1.0mm x H0.5mm optical QFN package.

The Ambient Light Sensing function provides three concurrent ambient light and flicker sensing channels, which can be arbitrarily connected to the photodiodes via a programmable multiplexer. TCS3410 incorporates a set of RGB photodiodes and a Clear photodiode. The RGB and Clear photodiode area is covered with a UV/IR blocking filter.

This architecture accurately measures ambient light and enables the calculation of irradiance of different light sources. Calculation results help to improve display appearance and picture taking.

The device also integrates direct detection of ambient light flicker. Flicker detection is executed in parallel with ambient light sensing and has independent gain configuration. The flicker detection engine will sample and buffer data for calculating flicker frequencies externally on a host CPU.

Key Benefits & Features

The benefits and features of TCS3410 are listed below:

Figure 1:
Added Value of Using TCS3410

| Benefits | Features |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> Invisible ALS 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 8192x dynamic range by gain adjustment only 1mlux detectable illuminance Tailored ALS response <ul style="list-style-type: none"> UV/IR blocking filter for RGBC channels ALS interrupt with thresholds |
| <ul style="list-style-type: none"> Unique fast ALS integration mode | <ul style="list-style-type: none"> Flicker-immune ALS sensing with programmable integration time |
| <ul style="list-style-type: none"> Integrated ambient light flicker detection on chip | <ul style="list-style-type: none"> Concurrent flicker and ALS measurement with new simplified readout methodology Independently configurable sample time and gain Up to 7kHz flicker detection (14kHz sampling) FIFO buffer interrupt |
| <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 I²C interface up to 1Mbit/s (Fast mode) |
| <ul style="list-style-type: none"> Integrated status checking for all functions | <ul style="list-style-type: none"> Digital and analog saturation flags |
| <ul style="list-style-type: none"> On chip data compression | <ul style="list-style-type: none"> Decreases traffic on I²C bus |

Applications

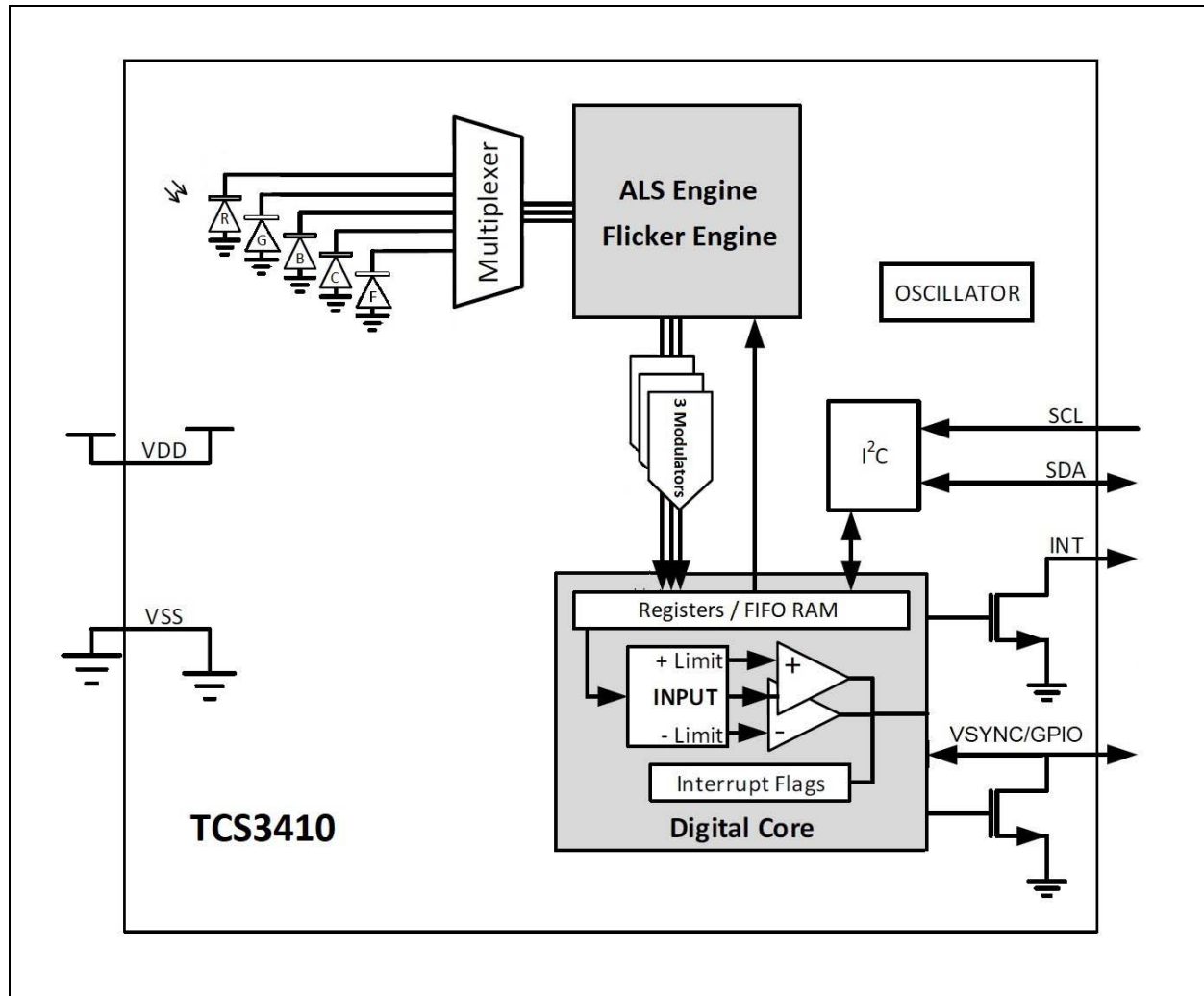
TCS3410 integrates multiple applications within one device. The applications for TCS3410 include:

- Indoor/outdoor brightness information
- Brightness management for displays
- Camera image correction assistance
- Flicker-immune camera operation

Block Diagram

The functional blocks of this device are shown below:

Figure 2:
Functional Blocks of TCS3410



Pin Assignments

Device pinout is described below.

Figure 3:
Pin Diagram of TCS3410 (top view)

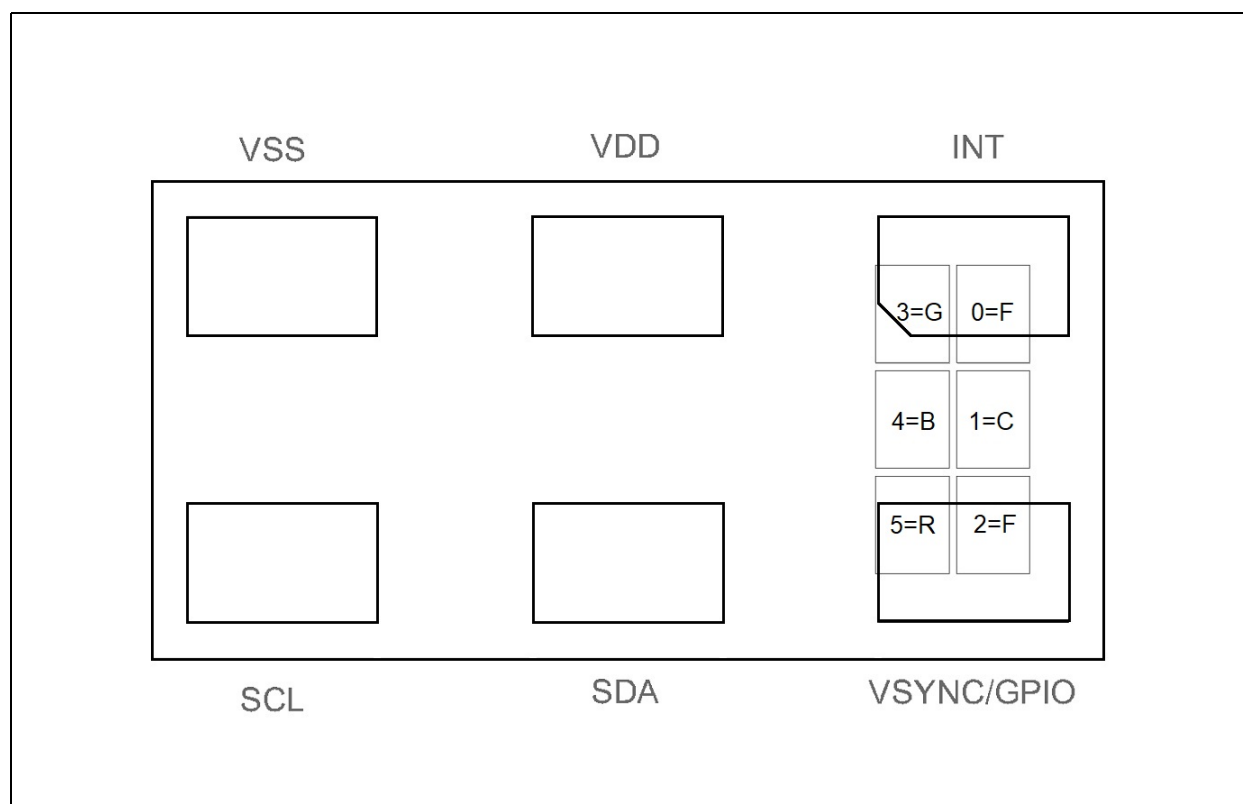


Figure 4:
Pin Description of TCS3410

| Pin Number | Pin Name | Description |
|------------|------------|------------------------------------------------------------------|
| 1 | INT | Interrupt. Open-drain output. |
| 2 | VDD | Supply voltage (1.8V) |
| 3 | VSS | Ground. All voltages are referenced to VSS. |
| 4 | SCL | I ² C serial clock terminal |
| 5 | SDA | I ² C serial data I/O terminal |
| 6 | VSYNC/GPIO | Synchronization input OR General Purpose open-drain Input/Output |

Ordering & Contact Information

Figure 5:
Ordering Information

| Ordering Code | Address | Interface | Delivery Form | Delivery Quantity |
|---------------|---------|-----------------------|---------------|-------------------|
| TCS34103 | 0x39 | 1.8V I ² C | Tape & Reel | 10000 pcs/reel |

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

RoHS Compliant & ams Green Statement

RoHS: The term RoHS compliant means that ams AG products fully comply with current RoHS directives. Our semiconductor products do not contain any chemicals for all 6 substance categories plus additional 4 substance categories (per amendment EU 2015/863), including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, RoHS compliant products are suitable for use in specified lead-free processes.

ams Green (RoHS compliant and no Sb/Br/Cl): ams Green defines that in addition to RoHS compliance, our products are free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material) and do not contain Chlorine (Cl not exceed 0.1% by weight in homogeneous material).

Important Information: The information provided in this statement represents ams AG knowledge and belief as of the date that it is provided. ams AG bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. ams AG has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. ams AG and ams AG suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

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.

Revision Information

This short datasheet was derived from v1-00 of full datasheet.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ams OSRAM:](#)

[TCS34103](#) [TCS34103M](#)