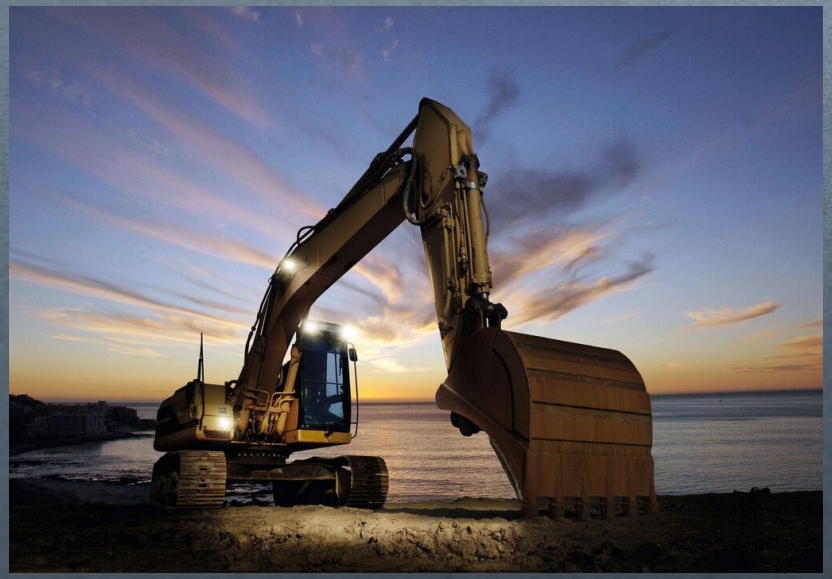
Sense the power of light



Transportation

Truck, Bus, Trailer, Agriculture and Construction Vehicle

Selection Guide

10/2024

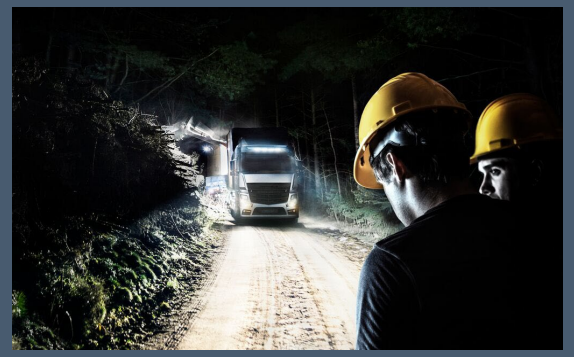
I - Optoeletronic solutions

Agenda

1. Headlamp
2. DRL
3. Front Turn Indicator
4. Rear Light & Turn Indicator
5. Position Light & Side Marker
6. Work Lights
7. Cluster and Switch Backlights
8. Ambient RGB
9. Ambient White
10. Display

Transportation – Headlamp

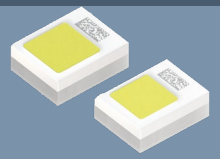
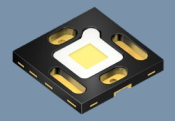
Static and dynamic forward lighting are elevating transportation safety to another level. More and more multifunctional intelligent headlamp systems illuminate the road and communicate with the surrounding environment at the same time using dynamic or moving light. This enhances driver visibility while simultaneously reducing glare for other road users.

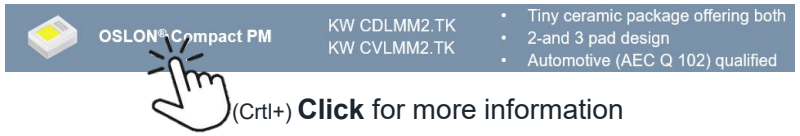


Special solutions such as the combination of high-power LEDs, ensure the best visibility in all road conditions and allow powerful high and low beams.

Transportation – Headlamp

Recommended Products

	**OSLON® Compact PM**	KW CDLMM1.TK	• smallest LED dimensions good for small lense or reflector design • Automotive (AEC Q 102) qualified
	**OSLON® Compact PL**	KW CWLPM3.TK KW CELNM3.TK	• compact LED dimensions with high efficacy • Automotive (AEC Q 102) qualified
	**OSLON® Black Flat S**	KW HHL532.TK (1-chip) 1- to 5-chip available	• best lm/€ value with high efficacy • Automotive (AEC Q 102) qualified
	**OSLON® Boost HM**	KW CELMM2.TK	• compact LED dimensions with highest luminance • slim design applications with small lense • Automotive (AEC Q 102) qualified



Transportation – Daytime Running Light

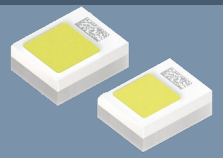
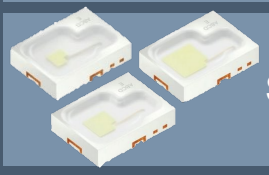
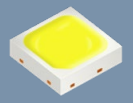
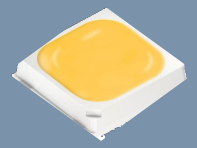
Daytime Running Lights contribute to a safe environment for road users and drivers. Due to their obvious advantages of high efficiency and long lifetime, LEDs are increasingly used for daytime running lights. Compared to conventional warm white incandescent lamp solutions, cold white LED color temperatures can be seen far earlier by other road users.

Transportation – Daytime Running Light

Recommended Products

OSLON® Compact PM	KW CDLMM2.TK KW CVLMM2.TK	• Tiny ceramic package offering both • 2-and 3 pad design • Automotive (AEC Q 102) qualified

(Crtl+) **Click** for more information

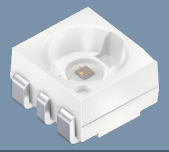
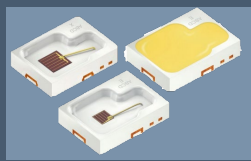
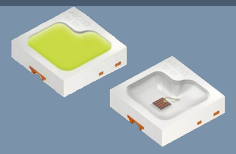
	**OSLON® Compact PM**	KW CDLMM1.TK	• smallest LED dimensions good for small lense or reflector design • Automotive (AEC Q 102) qualified
	**OSLON® Compact PL**	KW CWLPM3.TK KW CELNM3.TK	• compact LED dimensions with high efficacy • Automotive (AEC Q 102) qualified
	**SYNIOS® P2720**	KW DMLx33.SG	• scalability of this product family provides full performance and flexibility with just one footprint • Automotive (AEC Q 102) qualified
	**SYNIOS® S2222**	KW DDLM32.EH	• compact LED dimensions • Centered chip / square LES • high efficacy (lm/W) and Outdoor corrosion robustness
	**OSCONIQ® S3030**	GW QSLMS3.EM	• high efficacy >220 (lm/W) and good corrosion robustness • compact 30x30 LED dimensions • High lifetime L90 > 50k hours
	**SYNIOS® P2222**	KW DDLN31.SK	• compact LED dimensions, excellent thermal resistance • Automotive (AEC Q 102) qualified

Transportation – Turn Indicator

Yellow LEDs are used for turn indicators to indicate when vehicles are changing direction. Turn indicators increase the safety even further by enhancing the overall visibility with light structures that are in motion.

Transportation – Turn Indicator

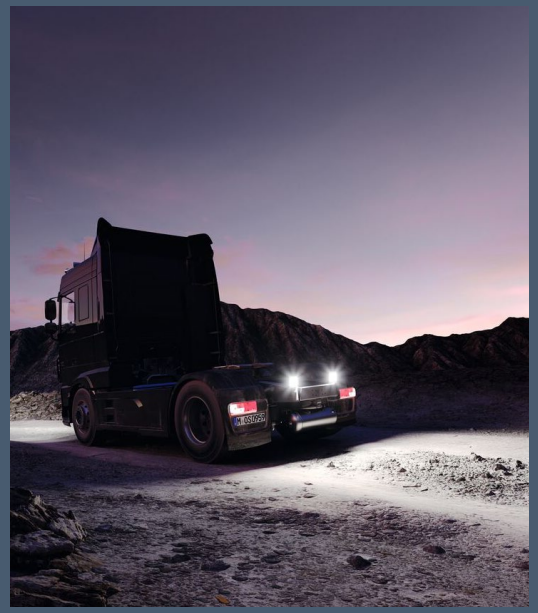
Recommended Products

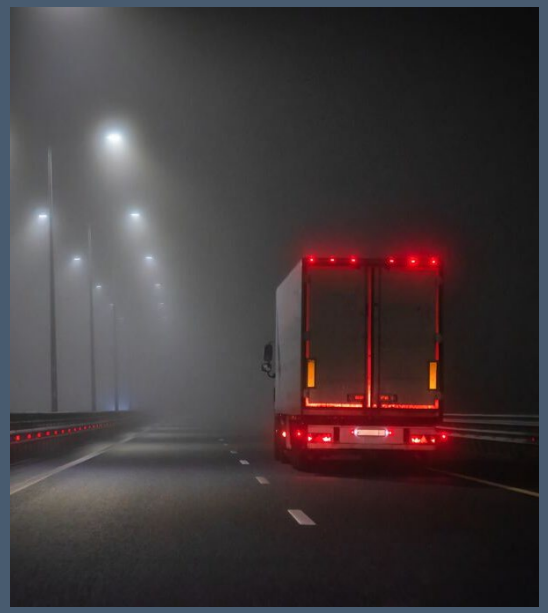
	**Advanced PowerTOPLED®.02**	LY G6SP.02	• high robustness • high power class • Automotive (AEC Q 102) qualified
	**SYNIOS® P2720**	KY DMLx31.23 KY DMLx31.FY KY DMLQ32.23	• scalability of this product family provides full performance and flexibility with just one footprint • Automotive (AEC Q 102) qualified
	**SYNIOS® P2222**	KY DDLN31.FY KY DDLN31.23	• compact LED dimensions, excellent thermal resistance • Automotive (AEC Q 102) qualified
	**SYNIOS® S2222**	KY DDLM32.FY KY DDLM32.23	• compact LED dimensions • Centered chip / square LES • high efficacy (lm/W) & Outdoor corrosion robustness
	**SYNIOS® P1515**	KY SITQA1.23	• Homogeneous area backlighting with limited height requirements • Automotive (AEC Q 102) qualified

OSLON® Compact PM | KW CDLMM2.TK
KW CVLMM2.TK | • Tiny ceramic package offering both
• 2-and 3 pad design
• Automotive (AEC Q 102) qualified

(Crtl+) **Click** for more information

Transportation – Rear Light, License Plate, Reverse Light

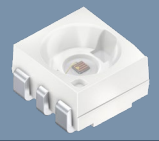
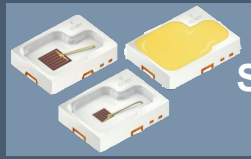
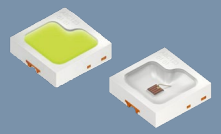
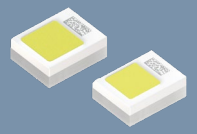
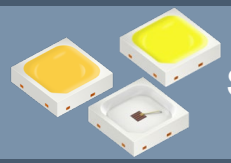


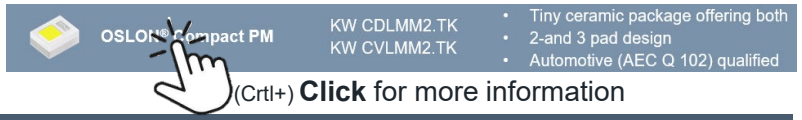


No matter whether the innovative rear light solutions include pixel, point, area, or light guide designs - LEDs by ams OSRAM are the perfect choice when it comes to enabling high freedom of design, allowing to combine up to four different light functions in a single light source. Turn indicators increase the safety even further by enhancing the overall visibility with light structures that are in motion.

Transportation – Rear Light, License Plate, Reverse Light

Recommended Products

	**Advanced PowerTOPLED®.02**	LA/R/S G6SP.02	• high robustness • high power class • Automotive (AEC Q 102) qualified
	**SYNIOS® P2720**	KR/S DMLx31.23 Kx DMLQ32.23	• scalability of this product family provides full performance and flexibility with just one footprint • Automotive (AEC Q 102) qualified
	**SYNIOS® P1515**	Kx SITQA1.23	• Homogeneous area backlighting with limited height requirements • Automotive (AEC Q 102) qualified
	**SYNIOS® P2222**	Kx DDLN31.23 KW DDLN31.SK	• compact LED dimensions, excellent thermal resistance • Automotive (AEC Q 102) qualified
	**OSLON® Compact PL**	KW CWLPM3.TK KW CELNM3.TK	• compact LED dimensions with high efficacy • Automotive (AEC Q 102) qualified
	**SYNIOS® S2222**	KS/R DDLM32.23 KW DDLM32.EH	• compact LED dimensions • Centered chip / square LES • high efficacy (lm/W) & Outdoor corrosion robustness



Transportation – Position Light & Side Marker

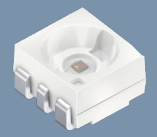
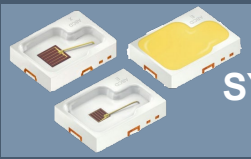
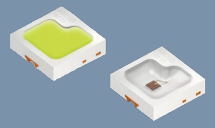
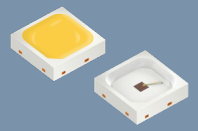
To meet a multitude of requirements, ams OSRAM offers an extensive product range for position and side marker lights which must be always switched on when driving. LEDs are increasingly used given their obvious advantages of high efficiency and long life. Cold white LED color temperatures can be seen far earlier by other road users. Featuring more compact dimensions and higher adaptability, LEDs allow far greater freedom of design, outshining other light sources, also in terms of aesthetics.

Transportation – Position Light & Side Marker

Recommended Products

OSLON® Compact PM	KW CDLMM2.TK KW CVLMM2.TK	• Tiny ceramic package offering both • 2-and 3 pad design • Automotive (AEC Q 102) qualified	

(Crtl+) **Click** for more information

 **PowerTOPLED®.01**	LA/R/S/Y E67F.01 Lx E6xF LA/Y ETSF	• high robustness • mid power class • Automotive (AEC Q 102) qualified
 **Advanced PowerTOPLED®.02**	LA/R/S/Y G6SP.02	• high robustness • high power class • Automotive (AEC Q 102) qualified
 **SYNIOS® P2720**	KY DMLN31.23 KY DMLN31.FY KR/S DMLN31.23	• scalability of this product family provides full performance and flexibility with just one footprint • Automotive (AEC Q 102) qualified
 **SYNIOS® P2222**	KY DDLN31.FY Kx DDLN31.23	• compact LED dimensions, excellent thermal resistance • Automotive (AEC Q 102) qualified
 **SYNIOS® S2222**	KY DDLM32.FY KY/S/R DDLM32.23	• compact LED dimensions • Centered chip / square LES • high efficacy (lm/W) & Outdoor corrosion robustness
 **DURIS® E2835**	GW JTLPS1.EM GW JTLMS1.EM Gx JTLPS1.xx	• Best price vs performance ratio • Wide range of colors available • Standard 2835 footprint

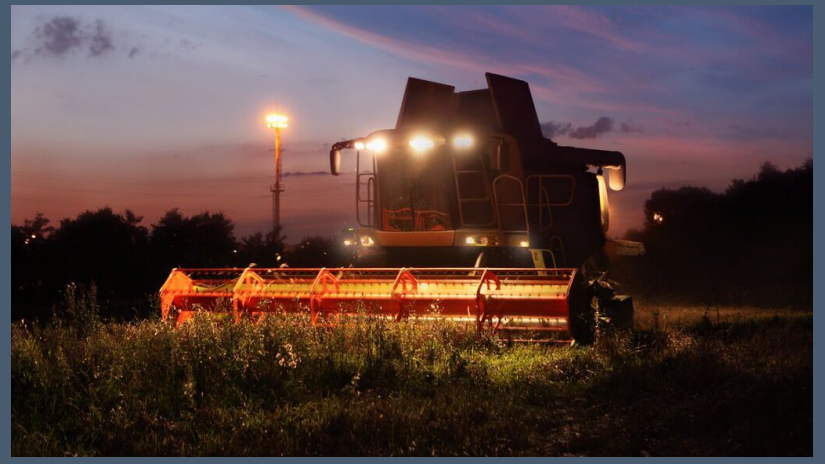
Transportation – Work Lights

We help our customers to ensure high operational productivity and safety in different weather conditions and in the dark.

ams Osram LEDs are designed for the toughest applications.

Robust and compact, with exceptional corrosion resistance, excellent lifetime, high efficiency and compact dimensions are the outstanding features of our LED families, which are perfect for work light specifications.

Whatever the time of day, these LEDs make work easier and keep things running smoothly - no need to stop working when the sun goes down and the days get shorter and the nights longer.

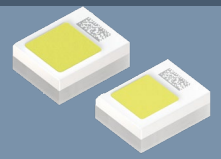
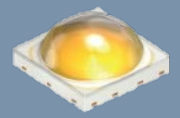
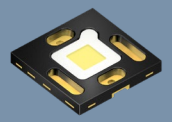
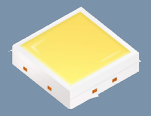
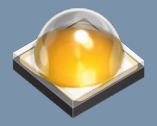
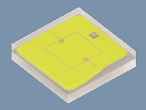


Transportation – Work Lights

Recommended Products

OSLON® Compact PM	KW CDLMM2.TK KW CVLMM2.TK	• Tiny ceramic package offering both • 2-and 3 pad design • Automotive (AEC Q 102) qualified	

(Crtl+) **Click** for more information

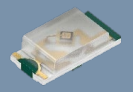
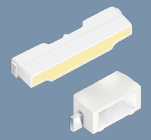
	**OSLON® Compact PL**	KW CWLPM3.TK KW CELNM3.TK	• compact LED dimensions with high efficacy • Automotive (AEC Q 102) qualified
	**OSCONIQ® P 3737**	GW PUSRA1.PM GW PUSTA1.PM	• Superior lifetime & corrosion-resistance performance • Single 3737 footprint covering extensive application range 1W – 9W • Excellent LM80: L90B50 >100khr
	**OSLON® Black Flat S**	KW HHL532.TK (1-chip) 1- to 5-chip available	• best lm/€ value with high efficacy • Automotive (AEC Q 102) qualified
	**OSCONIQ® C 3030**	GW PLTRA1.PM	• New product! launch in September 2024 • 3030 footprint to deliver leadership intensity performance • Max current up to 3000mA
	**OSLON® Square**	GW CSSRM3.PM	• Leadership performance & lifetime LM80 : L90 >100khrs • Exceptional corrosion-resistance performance • Max current up to 1800mA
	**OSLON® Square Flat**	KW CSLPM2.PC	• best performance (lm/W) • high robustness and wide CCT range • isolated heat sink

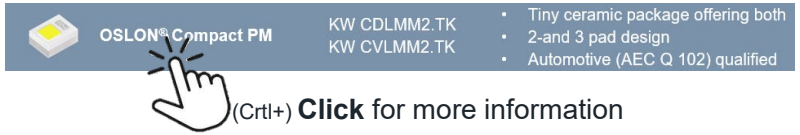
Transportation – Cluster and Switch Backlights

Traditional functional illumination plays a major role in the interior. New areas of automotive interior lighting, such as ambient and material illumination and even smart surfaces, are evolving with new applications. Key application trends like backlighting even smaller switches and buttons (sometimes in stacks and clusters), black surfaces, and light integration into interior materials are some of the upcoming topics in functional interior lighting.

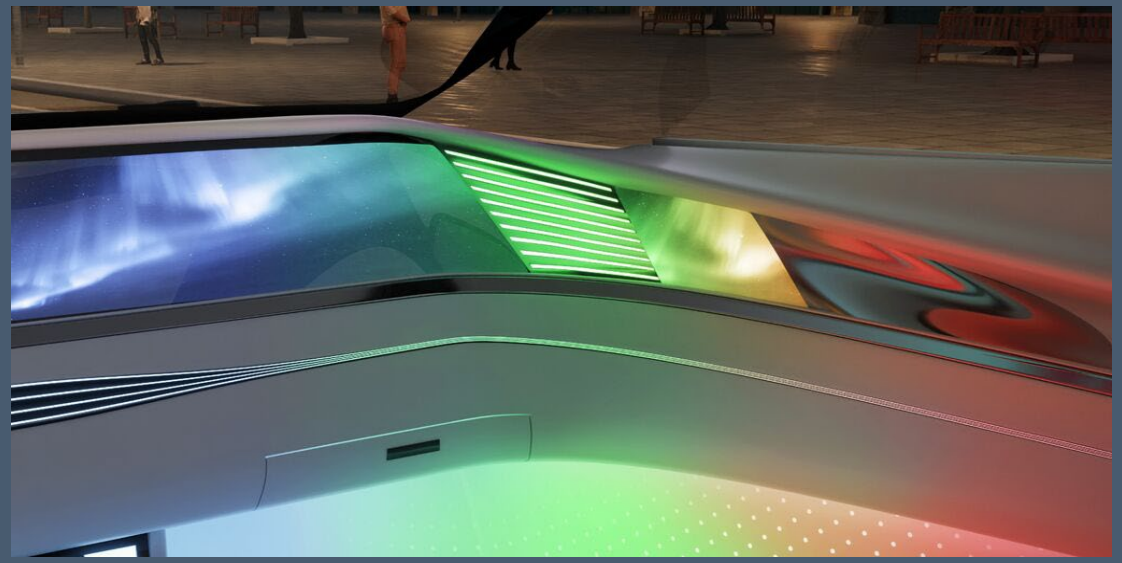
Transportation – Cluster & Switch Backlights

Recommended Products

	**TOPLED® E1608**	Kx DELxSx .xx	• Availability of full color and brightness range • best in price • Automotive (AEC Q 102) qualified
	**PointLED®**	LB / LW P4SG, LT PWSG LA/LO/LR/LS/LY P4SF LCB / LW P4SD	• round reflector • top and reverse-mount, full color spectrum • Automotive (AEC Q 101) qualified
	**SmartLED® 0603**	KB/KT EELP41.12 KW EELP41.RU KG/O/R/S/Y EELP41.22	• Small size offers perfect solution at space limited applications • flat backlighting of keypads, switches and dashboards • Power saving due to high intensity and low forward voltage
	**TOPLED® E3014**	KW DCLMS2.EC LUW JLSH.01	• ideal for injecting in light guides for homogeneous illumination • wide beam angle
	**Micro SIDELED®**	KRTB AILMS1 CUW Y3SH.B2 / Lx Y1SG Lx Y876 / Lx Y8SF	• Compact Sidelooker LED • Low profile 0.6 - 1.0 mm height • Full Color portfolio, White & RGB Versions



Transportation – Ambient RGB



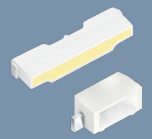
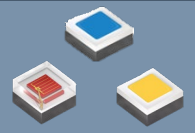
Ambient Lighting inspires a new atmosphere and transforms the surrounding into a space, balanced with the needed circumstances. From human-centric to colorful ambient lighting, from cockpit to passenger seat lighting, specialized and highly integrated LED solutions provide the right light. Light-based applications are becoming more than just a design feature. The light itself becomes interactive and is linked to dedicated functions, for example hidden beneath textiles, only visible when switched on.

Transportation - Ambient

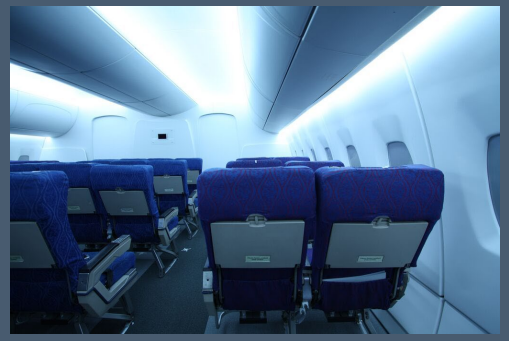
Recommended Products

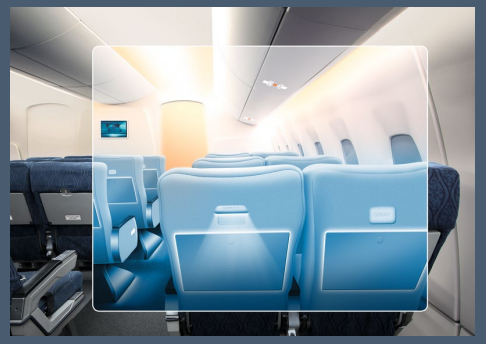
OSLON® Compact PM	KW CDLMM2.TK KW CVLMM2.TK		• Tiny ceramic package offering both • 2-and 3 pad design • Automotive (AEC Q 102) qualified

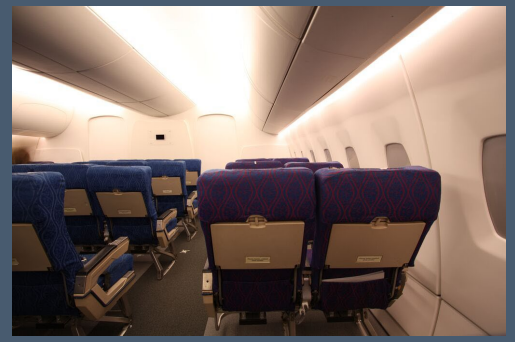
(Crtl+) **Click** for more information

	**TOPLED® E1608**	Kx DELxSx .xx	• Availability of full color and brightness range • best in price • Automotive (AEC Q 102) qualified
	**OSIRE® E3635**	LRTB GWSR	• Highest quality at competitive cost with narrow binning • Highest Flexibility in terms of driver selection and interconnection • Automotive (AEC Q 102) qualified
	**OSIRE® E5515**	KRTB AELPS1.32 KRTB AELPS2.32	• Basic and Advanced RGB LED version available • Advanced version with Calibration data off-line available • Automotive (AEC Q 102) qualified
	**Micro SIDELED®**	KRTB AILMS1 CUW Y3SH.B2 / Lx Y1SG Lx Y876 / Lx Y8SF	• Compact Sidelooker LED • Low profile 0.6 - 1.0 mm height • Full Color portfolio, White & RGB Versions
	**OSIRE® E3731i**	KRTBi D2LM31.31	• Intelligent RGB LED • integrated IC including calibration data and driver • Automotive (AEC Q 102) qualified
	**OSLON PURE® 1414**	Gx VJLPL1.xx	• Availability of full color and brightness range • best in price in high power class • 1.4mm x 1.4mm

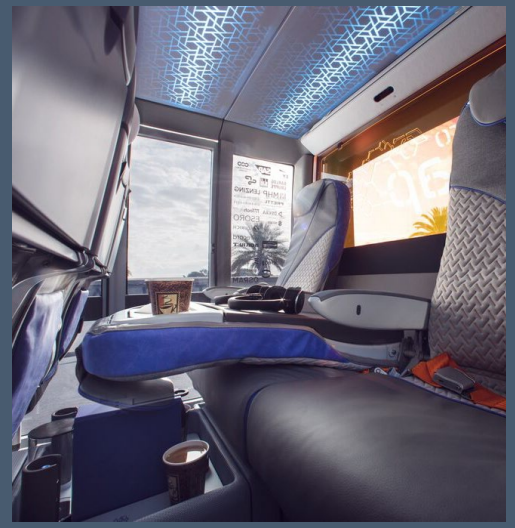
Transportation – Ambient White







Interior lighting is becoming increasingly important in the latest generation of vehicles and are undergoing a fundamental image change. By offering an excellent CRI level an outstanding color rendering for White Ambient Lighting is created, such as reading light or dome light. Even if it is “just” white light, a wide range of color is possible: from elegant, bluish cool white to cozy, reddish warm white the color spectrum offers a lot of capabilities.

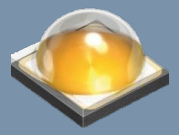
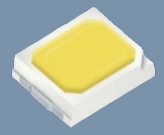


Transportation – Ambient white

Recommended Products

	**OSLON® Compact PM**	KW CDLMM2.TK KW CVLMM2.TK	• Tiny ceramic package offering both • 2-and 3 pad design • Automotive (AEC Q 102) qualified

(Crtl+) **Click** for more information

	**OSTUNE® E1608**	KW DELSS2.CC	• White LED with high color rendering index (CRI90+) • Wide range of color temperature available (CCT: 2.700 – 6.500 K) • Automotive (AEC Q 102) qualified
	**OSTUNE® E3030**	KW DSLP31.CC	• White LED with high color rendering index (CRI90+) • Wide range of color temperature available (CCT: 2.700 – 6.500 K) • Automotive (AEC Q 102) qualified
	**OSLON® Square**	GW CSSRM3.EM GW CSSRM3.CM GW CSSRM2.BM	• White LED with multiple CRI options (CRI 80, 90, 95) • Best in class CoA performance • LM-80: L90 > 150Khrs @105°C
	**OSCONIQ® S3030**	GW QSLMS3.EM	• high efficacy >220 (lm/W) and good corrosion robustness • compact 30x30 LED dimensions • High lifetime L90 > 50k hours
	**OSLON PURE® 1414**	GW VJLPL1.CM	• White LED with high color rendering index (CRI90+) • Wide range of color temperature available (CCT: 1.800 – 6.500 K) • Compact 1.4 x 1.4mm
	**OSCONIQ® E2835**	GW QTLTS1.EM	• Best reliability vs performance ratio • H2S resistance with L70>120khrs lifetime • 1000cycle of Temperature cycle test

Transportation – Display

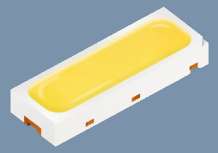
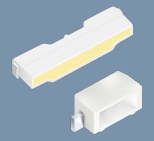
Displays are the interface between operators and their vehicle to deliver state-of-the-art interaction while traveling. Displays and smart or functional surfaces are replacing traditional instruments, buttons and switches more and more. Increasing display sizes, resolution and color gamut requirements drive the development of ever more efficient LEDs with optimized spectral properties. Additionally, the penetration of new solutions like direct display backlighting allow a higher contrast.

Transportation - Display

Recommended Products

	OSLON® Compact PM	KW CDLMM2.TK KW CVLMM2.TK	• Tiny ceramic package offering both • 2-and 3 pad design • Automotive (AEC Q 102) qualified

(Crtl+) **Click** for more information

	**SYNIOS® E1515**	KW SITQA1.KD	• Top lid for optimized radiation characteristics for homogeneous backlights • Automotive (AEC Q 102) qualified
	**SYNIOS® E4014**	KW DPLS34.KD	• on-screen color gamut of 110% NTSC • Automotive (AEC Q 102) qualified
	**TOPLED® E3014**	KW DCLMS2.EC LUW JLSH.01	• ideal for injecting in light guides for homogeneous illumination • wide beam angle
	**Micro SIDELED®**	KRTB AILMS1 CUW Y3SH.B2 / Lx Y1SG Lx Y876 / Lx Y8SF	• Compact Sidelooker LED • Low profile 0.6 - 1.0 mm height • Full Color portfolio, White & RGB Versions

II - Sensing solutions

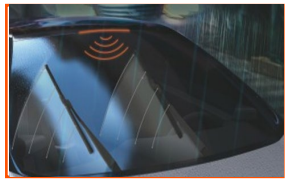
Tractor

Application Overview

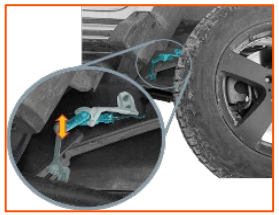
Joystick
(AS5600L/AS5403*)

HMI (Touch based sensing)
(AS8579)

ALS for automatic display brightness control
(SFH 5711/SFH 5701 A01, SFH 2770 A01)



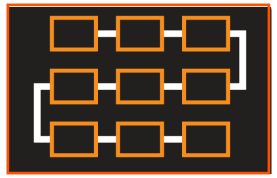
Rain-Light-Tunnel Sensors
(SFH 2200A01, BPW 34 FASR, SFH 4258/59, SFH 4248/49)



Chassis **P**osition **S**ensing, CPS
(AS5172E)

Active Pedals
(AS5200L)

Steer **B**y **W**ire, SBW and **E**lectric **P**ower **S**teering, EPS
(AS5147, AS5247 - dual die version)



Battery Management System
(AS8510/12)

Auxiliary Drives
Ex: Oil pump, water pump, air-conditioning, Electric brake booster
(AS5715x, AS5116, AS5147x, AS5115)

Traction Motors: BEV & HEV
(AS5147x, AS5116, AS5115, AS5715x)

Optical waterproof force/touch sensor, alternative to physical push buttons
(SFH 9206)

P/N	Product Type
AS8579	Capacitive Sensor
AS8510/ 12	IVT Sensor
AS5715R	Inductive Position Sensor
AS5171x	Magnetic Position Sensor (Angle Sensing)
AS5147x	Magnetic Position Sensor (Motor Control Sensing)
AS5116	Magnetic Position Sensor (Motor Control Sensing)
AS5115	Magnetic Position Sensor (Motor Control Sensing)
AS5200L	Magnetic Rotary Position Sensor (Motor Control Sensing)
AS5600L	Magnetic Rotary Position Sensor (Motor Control Sensing)
SFH 5711 / SFH 5701 A01	Ambient light sensor
SFH 9206	Analog optical force module
SFH 2770 A01	Ambient light sensor
SFH 2200 A01	Photodiode for optical sensing
BPW34FASR	Photodiode for optical sensing
SFH 4258/ 59	Low power IR Emitter 850nm
SFH 4248/ 49	Low power IR Emitter 940nm

* Product DS to be requested to ams OSRAM

Position sensors
- Magnetic
- Inductive

Motor Control Sensing

Magnetic Position Sensing for automotive applications – focus products

AS5116

Stray field immune angle position sensor with single ended and differential sine / cosine output

Offers : Contactless angle measurement , low output noise
Suitable for : Active damping System, Electric Drive Brake System

AS5x47y

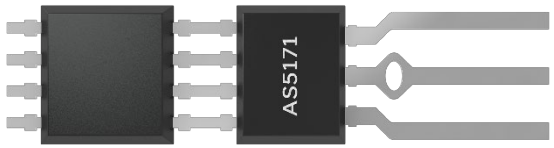
Stray field immune angle position sensor with single ended and differential SPI, UVW, ABI and PWM output

Offers : DAEC ™ Dynamic angle error compensation , DFS ™ Dynamic filter system
Suitable for : Electric Power Steering – Motor Position Sensing , closed loop motor control

Angle Sensing

Magnetic Position Sensing for automotive applications – focus products

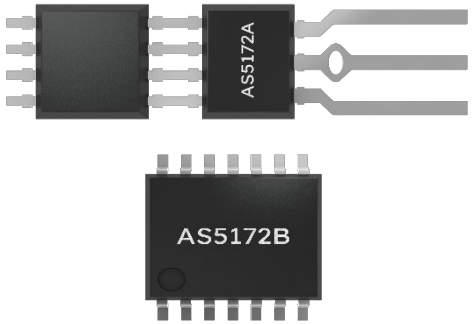
AS5171x



SIP package for PCB less design

Offers : 12-bit resolution, low output noise
Suitable for : Chassis ride height- angle position sensing , Acceleration and Brake Pedals, Applications with measurement range ≤ 360°

AS5172x



SIP package for PCB less design enabled with PSI5 interface for supply and data communication over just two wires

Offers : 12-bit resolution, low output noise
Suitable for : Chassis ride height- angle position sensing , Acceleration and Brake Pedals, Applications with measurement range ≤ 360°

AS5200L

Dual die Position sensor with output in both I2C and PWM

Offers :Contactless angle measurement, Digital output over I2C or PWM-encoded output
Suitable for : Gear shifter, Pedal

AS5171E Product Overview

System In Package Angle sensing Position Sensor

Key Features

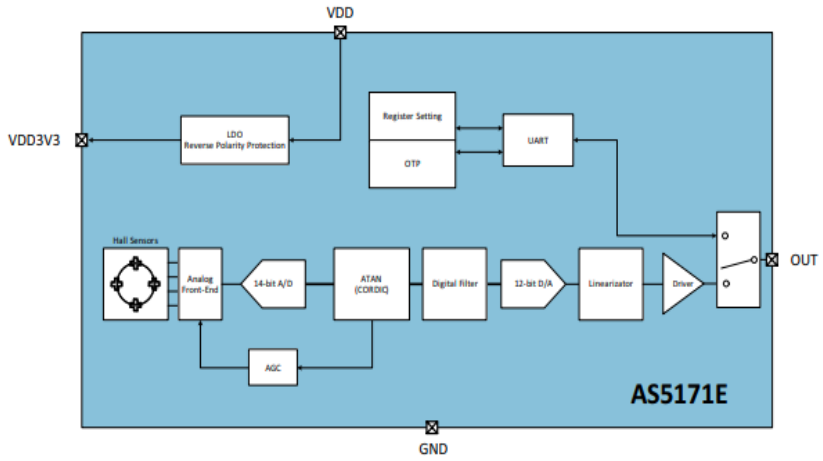
- analog ratiometric output
- Low output noise, low inherent INL
- Magnetic stray field immunity
- Functional safety, diagnostics, dual redundant chip version
- AEC-Q100 Grade 0 qualified

Benefits

- Resolve small angular excursion with high accuracy
- Accurate angle measurement
- Higher durability and lower system costs (no shielding needed)
- Enabler for safety critical applications
- SiP package (sensor + decoupling capacitors for ESD/EMC)

Applications

- Chassis ride height- angle position sensing
- Acceleration and Brake Pedals
- Applications with measurement range ≤ 360°



AS5172E Product Overview

High resolution PSI5 output enabled Angle sensing Position sensor

Key Features

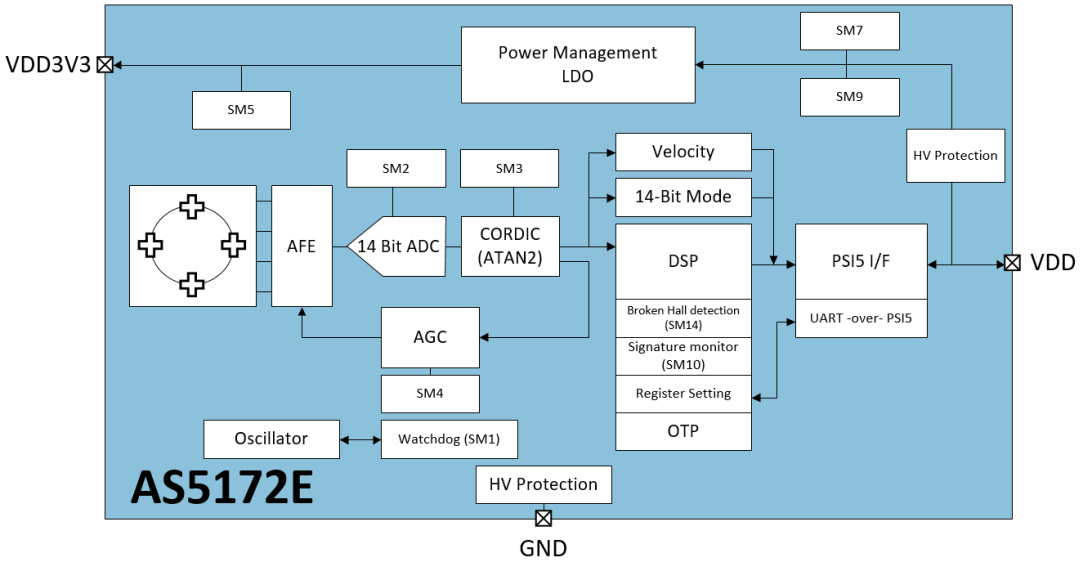
- 12-bit resolution @90° minimum arc
- Low output noise, low inherent INL
- Magnetic stray field immunity
- Functional safety, diagnostics
- AEC-Q100 Grade 1 qualified
- System cost reduction – no PCB and additional components are needed

Applications

- Chassis ride height- angle position sensing
- Acceleration and Brake Pedals
- Applications with measurement range ≤ 360°

Benefits

- Resolve small angular excursion with high accuracy
- Accurate angle measurement
- Higher durability and lower system costs (no shield needed)
- Enabler for safety critical applications
- Suitable for automotive applications
- SIP Package (System-in-Package)



AS5200L Product Overview

Contactless easy to program Angle Sensing Position Sensor

Key Features

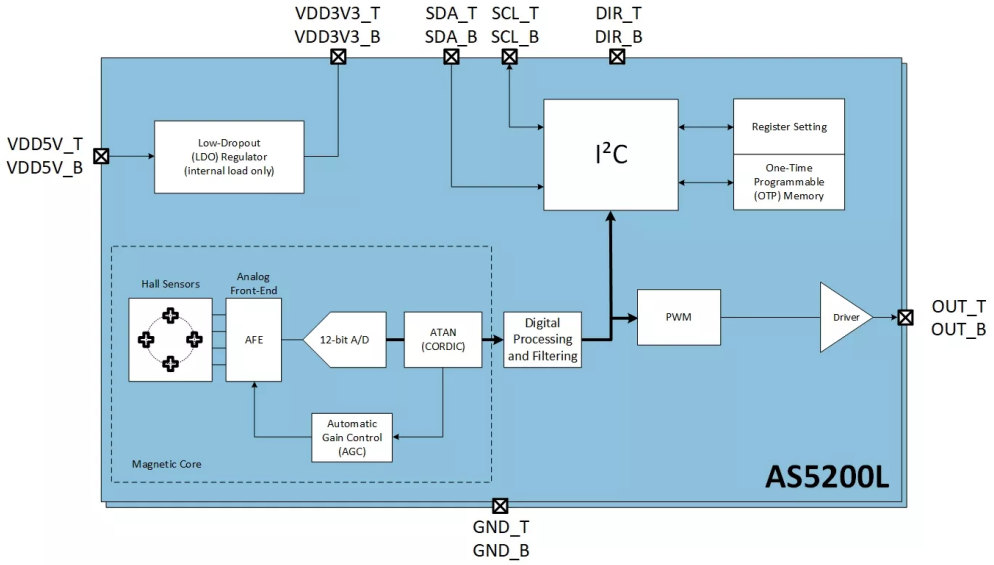
- Contactless angle measurement
- Digital output over I2C or PWM-encoded output
- Automatic magnet detection
- MLF-16 (5mm x 5mm) package with wettable flanks
- AEC-Q100 automotive qualified

Benefits

- Highest reliability and durability
- Accurate angle measurement
- Simple programming
- Low-power consumption
- Suitable for safety critical automotive applications

Applications

- Gear Shifter, Pedals



AS5147U Product Overview

Fast angle sensing Position Sensor equipped with Dynamic Filter System

Key Features

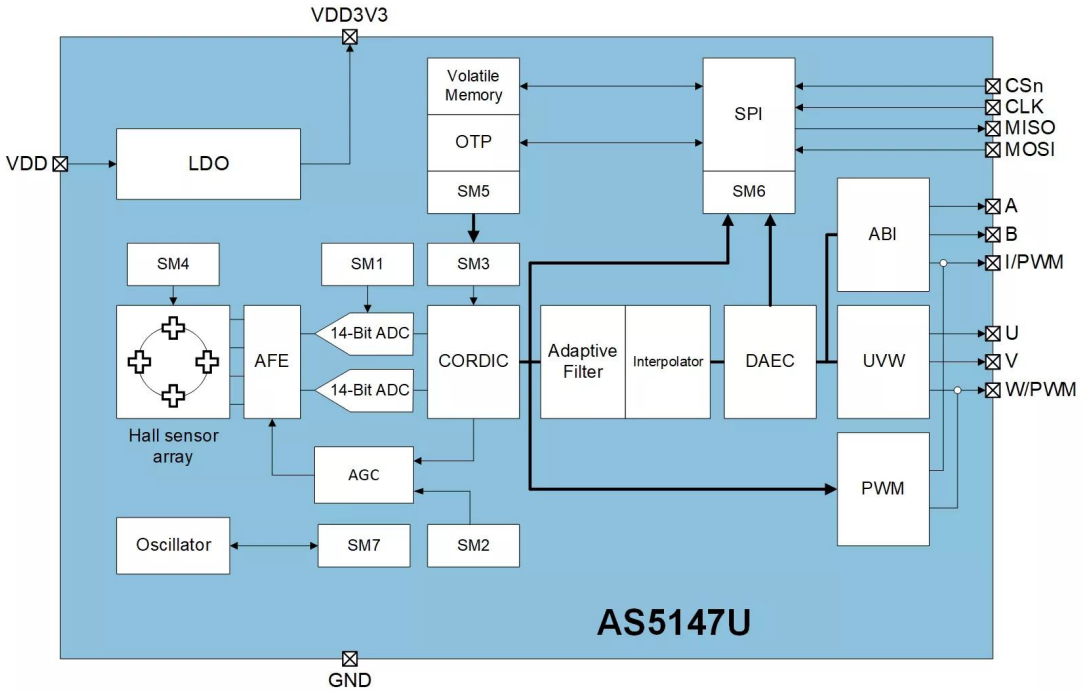
- DAEC ™ Dynamic angle error compensation
- DFS ™ Dynamic filter system
- Magnetic stray field immunity
- Developed according ISO26262, diagnostics, dual redundant chip version ASIL-D capable, Safety Element out of Context (SEooC)
- AEC-Q100 Grade 0 qualified
- Independent output interfaces: SPI, ABI, UVW, PWM

Applications

- Electric Power Steering –Motor Position Sensing
- Closed Loop Motor Control

Benefits

- Easy to use – saving costs on DSP
- Higher durability and lower system costs (no shield needed)
- Enabler for safety critical applications
- Suitable for automotive applications
- Versatile choice of the interface



AS5115 Product Overview

Contactless Fast Angle Sensing Position Sensor

Key Features

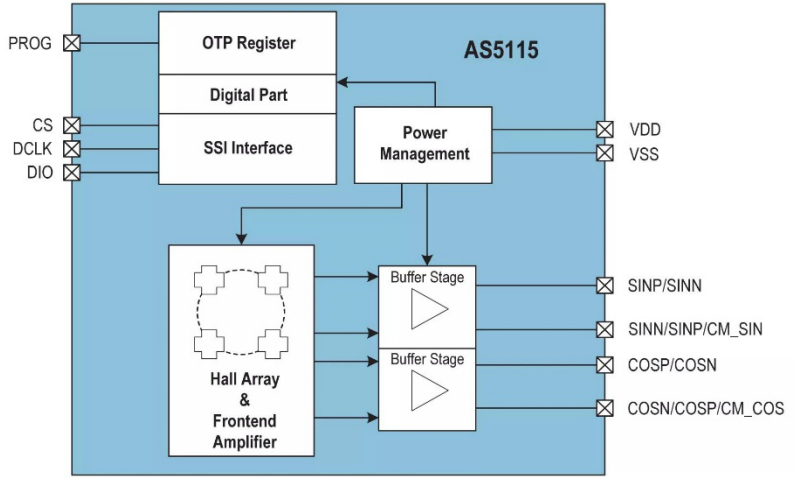
- Contactless high resolution rotational position encoding over a full turn of 360 degree
- Simple user-programmable over serial interface (SSI)
- Buffered sine and cosine output signal
- Low power mode
- Serial read-out of multiple interconnected devices using daisy chain mode
- AEC-Q100, grade 0
- SSOP 16 package
- Wide temperature range: -40°C to +150°C

Applications

- Active damping System - highly dynamic Hydraulic Pump
- Electric Drive Brake System
- Robotics

Benefits

- Highest reliability and durability
- Simple programming
- High precision analog output
- Very low average power consumption
- Easy setup
- Fully automotive qualified
- Small form factor
- Robust environmental tolerance



AS5116 Product Overview

Contactless Fast Angle Sensing Position Sensor

Key Features

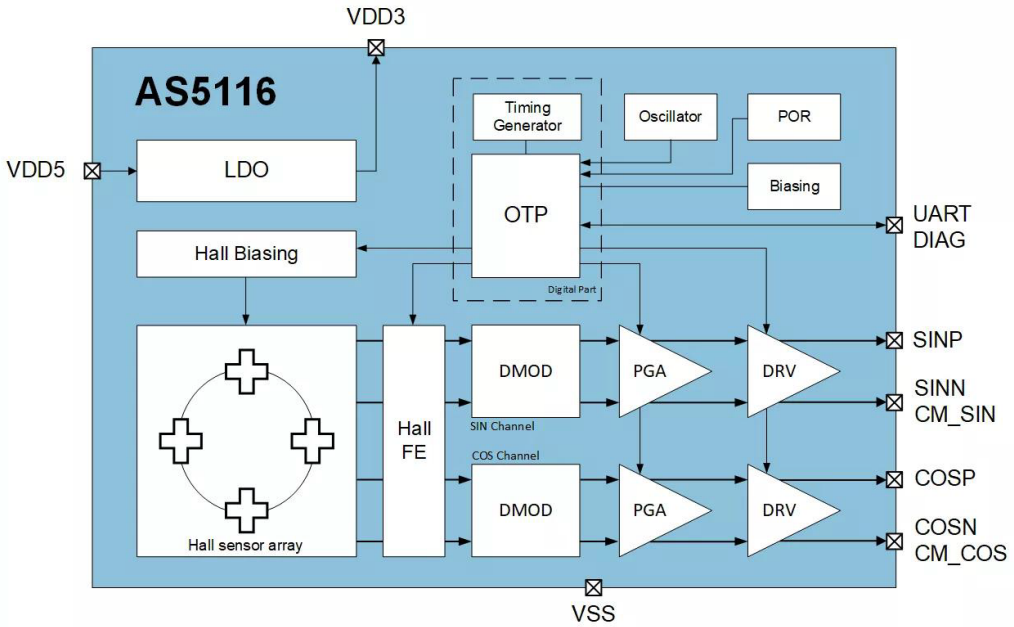
- Contactless angle measurement
- Low output noise
- Low inherent INL
- Magnetic stray field immunity overachieves ISO 11452-8
- Developed according to ISO26262
- Fully differential buffered sine and cosine output signals
- AEC-Q100, grade 0

Applications

- Active damping System - highly dynamic Hydraulic Pump
- Electric Drive Brake System

Benefits

- Highest reliability and durability
- Accurate angle measurement
- Low system costs – no shielding required
- Enabler for safety critical applications
- High precision analog output
- Small form factor



AS5047U Product Overview

High-resolution rotary position sensor for full absolute angle measurement over full 360 degrees range

Key Features

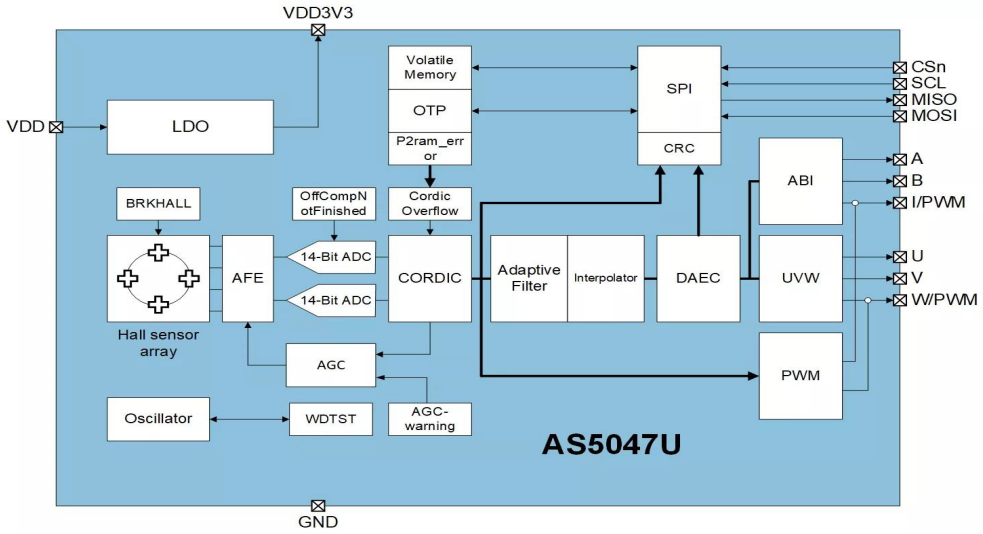
- DAEC™ dynamic angle error compensation
- DFS (Dynamic Filter Setting)
- 14-bit core resolution
- ABI programmable decimal and binary pulse-count (500, 400, 300, 200,
- 100, 50, 25, 8, 4096, 2048, 1024, 512, 256 ppr)
- Zero position, configuration programmable
- Independent output interfaces: SPI, ABI, UVW, PWM
- Immune to external stray field

Benefits

- Easy to use – saving costs on DSP
- Good resolution for motor and position control
- Simple optical encoder replacement
- No programmer needed (via SPI command)
- Versatile choice of the interface
- Lower system costs (no shielding)

Applications

- Industrial : Brushless motor control
- Robotics
- Home & Building automation



Features: Why to choose ams OSRAM for Magnetic Position Sensors

ams OSRAM is shaped to lead the Magnetic Position Sensors market and generate fast revenue growth

Competitive advantage (USP)

Stray Field Immunity

- Robustness against unwanted external magnetic stray fields
- Reduced BOM - eliminates the need for shielding
- Cost-effective sensor solutions (saving costs on DSP and additional shielding)

Improved accuracy, lowest propagation delay

- Up to 14 bit resolution and ≈ ±1.0° guaranteed maximum angle error over temperature without calibration
- Operating Bz Magnetic Field Range 5-10mT to 90mT
- Elimination of angle measurement lag/faster refresh rates (1.9us) at high RPMs

Guaranteed Supply chain and Local support

- Flexible in house Supply chain located in neutral Austria. 0.45ppm in past years.
- 0 line down in the last 4 years.

Key features

Functional Safety

- ISO26262 compliant up to ASIL-D

Increased functionality

- Several Interfaces variants (SPI, I²C, ABI, UVW, and PWM) for improved motor efficiency
- On-chip DSP (digital signal processor) increases performance
- DAEC for compensation of propagation delay

Space and weight saving

- Flexible design configurations for individual application systems

AS5715x

Inductive Position Sensing for automotive & industrial applications

AS5715x

An inductive position sensor is used for high-speed position sensing (up to 480000 rpm) and the output is analog differential (sine/cos)for robust data transmission . It is defined as SEooC (Safety Element out of Context) according to ISO26262

Offers : In system programmable (I2C interface), 8 kHz output bandwidth, AEC Q-100 Grade 0 (160° C), ISO26262 ASIL C (D)
Suitable for : Traction Motor control in Electric vehicle, BLDC Motor , Brake booster , Electric power steering, Replacement of resolvers, Industrial robot

AS5715R Product Overview

Inductive high speed position sensor

Key Features

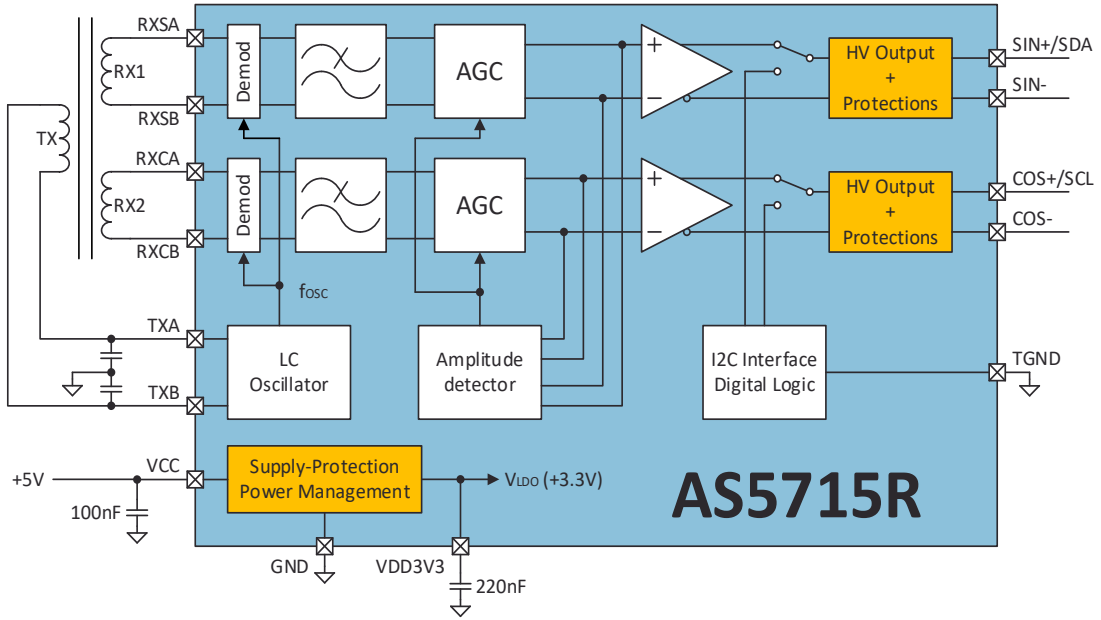
- TSSOP-14 package
- 5V supply
- 8kHz output bandwidth enables applications up to 480000 rpm electrical
- Differential and single ended SIN/COS output interface
- propagation delay ranges from 2 to 3.3 µs
- AEC Q-100 Grade 0 qualified
- Maximum ambient temperature: -40 to 160 °C
- ISO26262: ASIL C(D)
- Typical system accuracy of 0.3° electrical (mechanical accuracy is better by the number of pole pairs)
- ISO 11452-8:2015 (Stray Field) compliant without further measures (i.e. shielding)
- In system programmable (I2C interface)

Applications

- Electric brake boosters
- Traction motors (EV, hybrid)
- BLDC/PMSM motor control

Benefits

- Reduces system costs due to dual die design
- Relevant protections included (reverse polarity, OV protection, short circuit protection…)



Features: Why to choose ams OSRAM for Inductive Position Sensors

ams OSRAM is shaped to lead the Inductive Position Sensors market and generate fast revenue growth

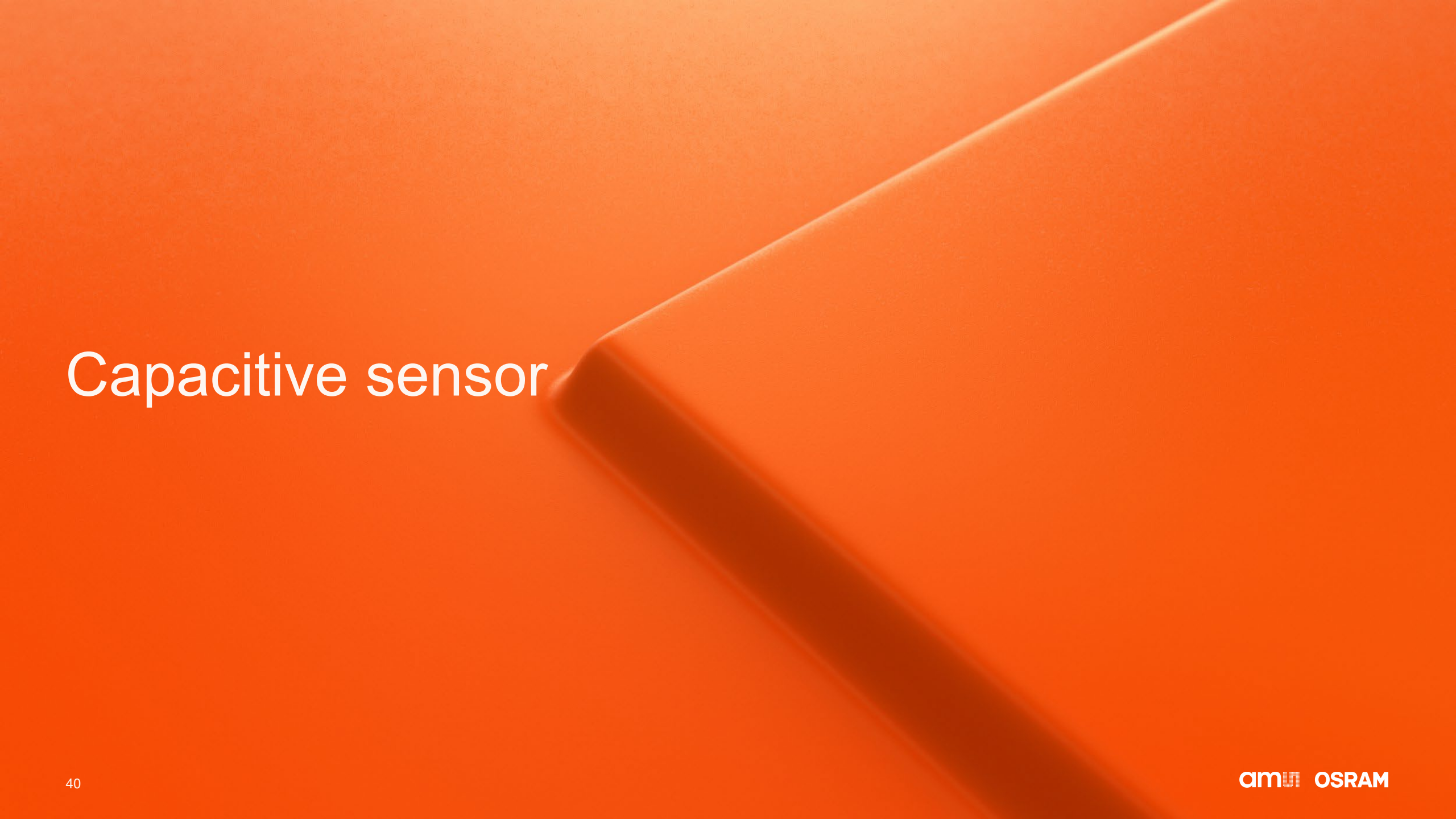
Competitive advantage (USP)

Very high-speed sensing	Lowest propagation delay	Guaranteed Supply chain
▪ Measurement of target position rotating with speed of up to 480000 rpm	▪ Propagation delay ≤ 3,3 µs	▪ Flexible in-house Supply chain, 0.45ppm in past years ▪ 0 line downs in the last 4 years

Key features

Cost saving over resolver & optical sensing technology	Automotive Qualification and functional safety	Highly customizable
▪ Offers state of the art functionality (same accuracy as resolver) but at very competitive pricing	▪ AEC Q-100 Grade 0 qualified; Fully operational up to ambient temperature of 160°C ▪ ISO26262 ASIL C(D) compliant	▪ Possible to customize for linear , off-axis and on-axis orientation measurement

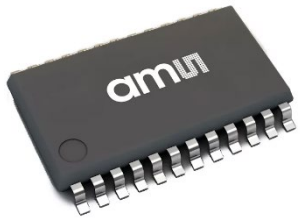
Capacitive sensor



AS8579

Capacitive Sensing for automotive, industrial & consumer applications

AS8579



A capacitive sensor that measures the relative change of the connected capacitance, originating between two electrodes. The capacitance value can be read through an SPI Interface which can be also used for configuring the capacitive sensor IC.

Offers : AEC-Q100 Grade 1 qualified , ASIL B according ISO26262, I&Q measurement principle (separation of resistive and capacitive) with accumulated 14-bit resolution

Suitable for : Human presence detection / Human machine interface (non-automotive/automotive) ; Autonomous driving applications ; Capacitive Interior Controls/Switches (non-automotive/automotive) ; Fluid Level Sensing (non-automotive/automotive)

AS8579 Product Overview

Touchless and wearfree Capacitive sensor

Key Features

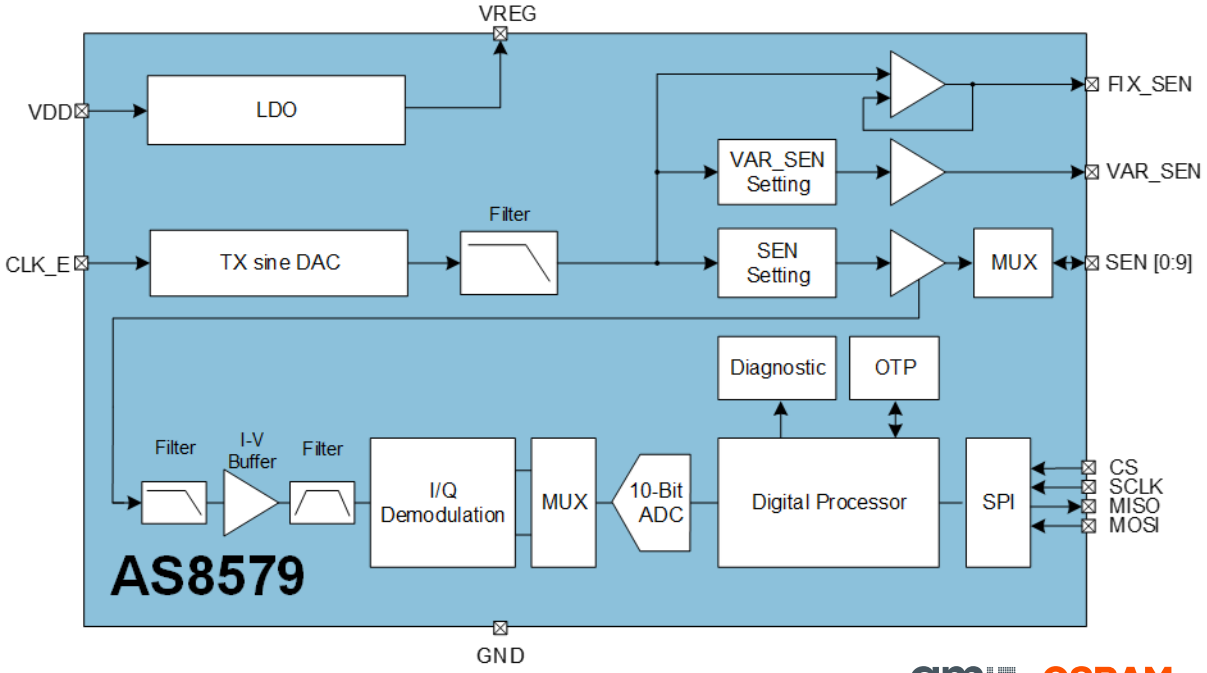
- Separate I&Q measurement (separation of resistive and capacitive) with accumulated 14-bit resolution each
- Up to 10 independent measurement lines with active shielding
- Programmable frequency for impedance measurement
- Achieving Functional safety ASIL B according ISO26262
- AEC-Q100 Grade 1 qualified
- Long term delivery and quality due to ams Osram's own production site in central Europe

Applications

- Autonomous driving applications (hands on steering wheel detection)
- Detection of any human presence inside a vehicle (seat occupancy detection)
- Capacitive Interior Controls/Switches (A/C, radio, navigation)
- Fluid Level Sensing (non automotive/automotive)

Benefits

- Accurate capacitive measurement with excellent sensitivity at wide effective range
- Touchless and wear free technology
- Outstanding quality and high durability at lower system costs
- Enabler for safety critical applications
- Suitable for automotive applications



Features: Why to choose ams OSRAM for Capacitive Sensors

ams OSRAM is shaped to lead Capacitive Sensors market and generate fast revenue growth

Competitive advantage (USP)

Price Performance Ratio

- Outstanding quality and high durability at lower system costs
- Accurate capacitive measurement with excellent sensitivity at wide effective range

High detection reliability

- Separate I&Q measurement (separation of resistive and capacitive) with accumulated 14-bit resolution each

Guaranteed Supply chain

- Flexible in-house Supply chain, 0.45ppm in past years
- 0 line downs in the last 4 years

Key features

Qualification

- AEC-Q100 Grade 1 qualified
- Functional safety ASIL B according ISO26262

Technology

- Touchless and wear free technology
- Solution can use existing steering wheel components for measurement therefore no additional components is necessary

Measurement

- Up to 10 independent measurement lines with active shielding
- Programmable frequency for impedance measurement

IVT sensor

AS8512 product family offers compelling IVT sensing solutions

IVT sensing for industrial, medical & consumer applications

AS8512


AS8512 is a current, temperature and voltage (IVT) sensor tailored to accurately measure wide range of current ranging from mA to 1500kA with 16-bit resolution over temperature range of -40°C up to 105°C over SPI serial interface

Offers : High price performance ratio, offset-free measurement , two independent differential input channels, built-in self diagnostics
Suitable for : Grid energy storage systems ,Building Energy Storage Systems, E-mobility and battery driven devices

AS8510 Product Overview

High accuracy industrial IVT sensor

Key Features

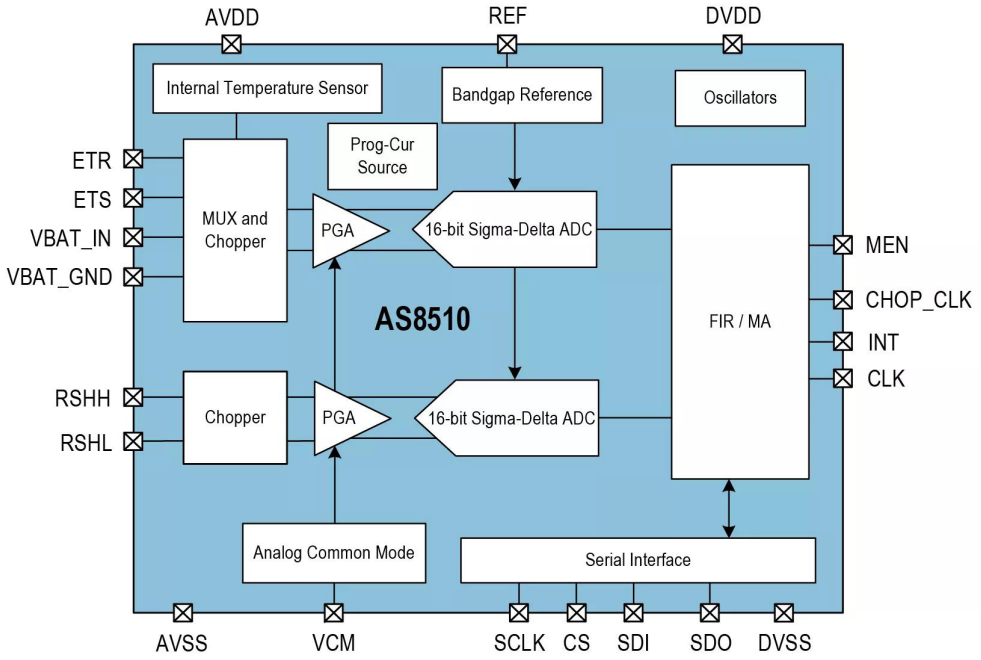
- Low supply voltage
- Redundant measurement possibility
- Flexible configuration
- Unique measurement principle

Benefits

- 3.3V supply voltage
- Two high resolution 16-bit Sigma-Delta A/D converters
- Programmable sampling to enable data throughput from less than 1Hz to 8kHz
- Zero offset for both channels

Applications

- Grid Storage Systems
- Energy Storage Systems at Home
- E-bikes



Features: Why to choose ams OSRAM for IVT Sensors

ams OSRAM is shaped to lead IVT Sensors market and generate fast revenue growth

Competitive advantage (USP)

Price Performance Ratio

- High accuracy over full temperature and measurement range

Unique measurement principle

- Special measurement priciple (Chop/dechop) allowing offset –free measurement

Guaranteed Supply chain

- Flexible in-house Supply chain, 0.45ppm in past years
- 0 line downs in the last 4 years

Key features

Wide measurement range

- Offers a wide current measurement range from 1 mA to 1.5 kA

Easy integration

- SPI interface is used as interface between the AS8512 and an external micro-controller to configure the device and access the status information
- SPI protocol is simple

Low linearity error

- Offers a very low linearity error of ±0.25 % over full measurement range

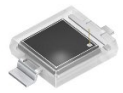
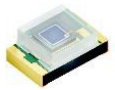
Optical Sensing

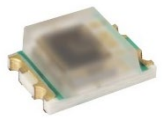
Automotive Detector and Sensor Portfolio

Photodiodes (PD), Phototransistors (PT), ALS Detectors and Sensors

PD	ALS PD	ALS PT	ALS IC	Others
SFH 2200 A01 Broadband 5.1 x 4.0 x 0.85 TOPLED D5140				
SFH 2700FA A01 Broadband + Filter 2.0 x 1.25 x 0.80 ChipLED	**SFH 2770 A01** VLambda 2.0 x 1.25 x 0.80 ChipLED		**SFH 5721** Photopic ALS 2.x 2.0 x 0.5 **Industrial Only**	
SFH 2400 FA Broadband + Filter 4.6 x 2.0 x 1.05 Smart DIL	**SFH 2711/16 A01** VLambda 2.0 x 1.25 x 0.80 ChipLED	**SFH 3711/16** VLambda 2.0 x 1.25 x 0.80 ChipLED	**SFH 5711** VLambda 2.8 x 2.2 x 1.1 ChipLED	
BPW 34 xxS Broadband + Filter 6.5 x 3.9 x 1.15 DIL SMT	**SFH 2430** VLambda 6.5 x 3.9 x 1.15 DIL SMT	**SFH 3410/10R** VLambda 4.6 x 2.0 x 1.05 Smart DIL	**SFH 5701 A01** VLambda 2.0 x 1.25 x 0.80 ChipLED	**SFH 9206** Filter 4.0 x 6.0 x 1.9 Reflective Interruptor

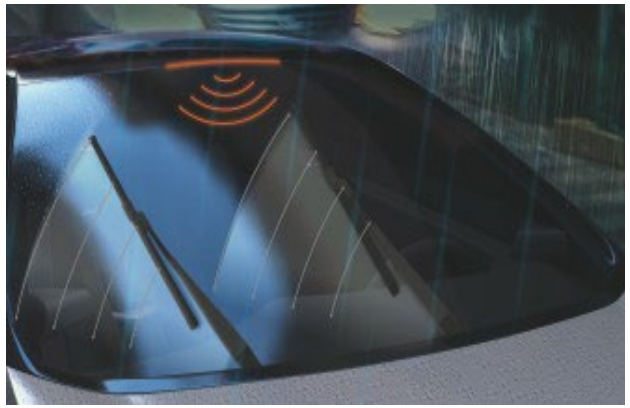
Key products




RLS (Rain Light Sensors)

Basics



Rain Light Sensors Requirements

RLS are attached to the windscreen and located behind the rear-view mirror. The sensors perform multiple functions, such as:

- Rain detection and automatic wiper control
- Light detection for automatic switch-on of headlamps or control of display backlighting
- Tunnel detection for automatic headlamp switch when entering/leaving a tunnel

We are market leader in opto components used in rain sensors with a market share of >40%, serving this market for more than 20 years

Recommended Product Families

IRED

TOPLED

- 850 nm and 940 nm
- Reverse mounting available
- AEC Q102 qualified

PowerTOPLED

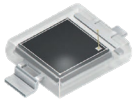
- 850 nm and 940 nm°
- Lens options: +-15° and +-25°
- AEC Q102 qualified

OSLON Piccolo

- Lambertain beam characteristic
- 940 nm
- AEC Q102 qualified

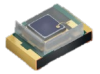
Ambient Light Sensor

DIL SMT



SFH 2430

ChipLED



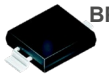
SFH 2716
A01
SFH 3711
SFH 3716

ChipLED based IC

SFH 5701
A01
SFH 5711

Photodiode Detectors

DIL SMT



BPW 34FAS

ChipLED

SFH 2700 FA A01
SFH 2711 A01

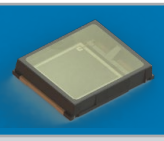
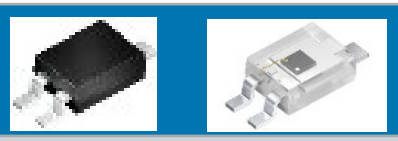
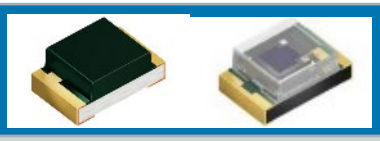
Smart DIL

SFH 2400 FA

TOPLED D5140

SFH 2200 A01

Photodiode Portfolio for Optical Sensing

				
Product name	BPW 34 FAS BPW 34 S	SFH 2200 A01	SFH 2400 FA SFH 2400	SFH 2700 FA A01 SFH 2700 A01
Product Brand	DIL SMT	TOPLED D5140	SmartDIL	ChipLED
Dimension	6,50 x 3,90 x 1,15 mm^3	6,50 x 3,90 x 1,15 mm^3	4,60 x 2,00 x 1,05 mm^3	2,00 x 1,25 x 0,80 mm^3
Sensitive area	7,02 mm^2	7,02 mm^2	1,00 mm^2	0,35 mm^2
Photocurrent*	50 µA	46 µA	6,2 µA	3 µA
Dark Current	2 nA	1 nA	1 nA	0,045 nA
Capacitance	72 pF	60 pF	11 pF	4,6 pF

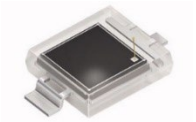
* Measurements at: V_R=5 V, 850 nm, Ee= 1 mW/cm^2

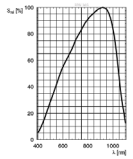
Package size (mm)	2.2 x 3.6 x 1.0mm

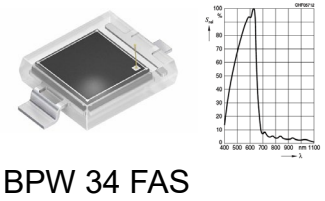
New Product Family TOPLED D5140

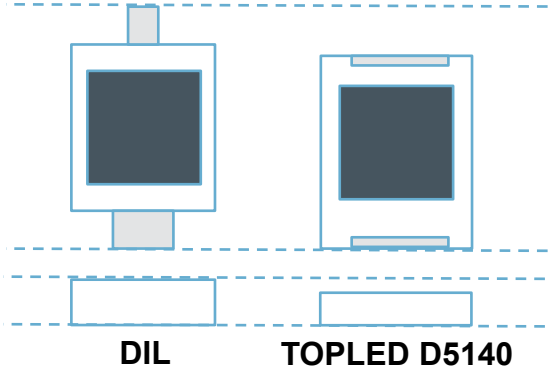
Smaller footprint and increased temperature range compared to DIL products

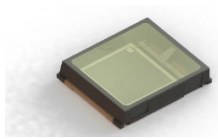
	Package family DIL BPW 34	Package family TOPLED D5140
Footprint (SMT device)	3,9 (4.4) x 6.50 mm² => ~25 mm²	4.0 x 5.1 mm² => ~20 mm² (-20%)
Height	1.15 mm	0.85 mm (-26%)
Leads	supernatant	no supernatant leads
Side	transparent	light blocking
Temperature range	-40° … 100°C	-40°C…125°C
Devices for various spectral ranges	BPW 34 S (broad band) BPW 34 FS (day light filter) BPW 34 FAS (day light filter) SFH 2430 (ALS + IR region)	SFH 2200 A01 (broad band) SFH 2240 A01 ((ALS, V lambda) SFH 2201 A01 (blue enhanced)

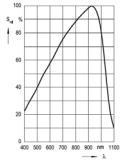

BPW 34 S



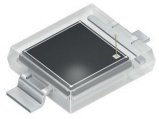

BPW 34 FAS

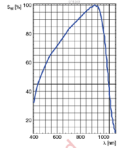


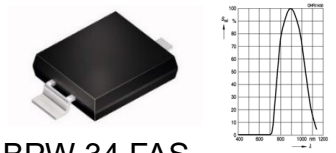

SFH 2200 A01




SFH 2201 A01


SFH 2401 A01




BPW 34 FAS


SFH 2240 A01

Ambient Light Sensors (ALS)

Basics

Ambient Light Sensors Requirements

ALS are used for automatic display dimming and headlamp switch-on. Their spectral sensitivity corresponds to the characteristics of the human eye. A variety of photosensor technologies are available like phototransistors, photodiodes and photo ICs, the latter with various filter functions and an analog or digital output.

Recommended Product Families

Ambient Light Sensors

Smart DIL

- Phototransistor with good Vλ approximation
- High photocurrent signal
- AEC Q102 qualified

DIL SMT

- Photodiode with good Vλ approximation
- Good linearity and temperature coefficient
- AEC Q102 qualified

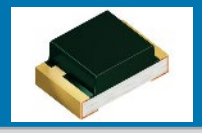
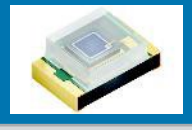
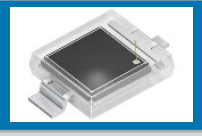
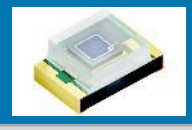
ChipLED

- Photodiode with very good Vλ approximation
- Good linearity and temperature coefficient
- Very small footprint
- AEC Q102 qualified

ChipLED based IC

- Optical filtering, temperature compensation
- Analog output
- Logarithmic output available
- AEC Q102 qualified

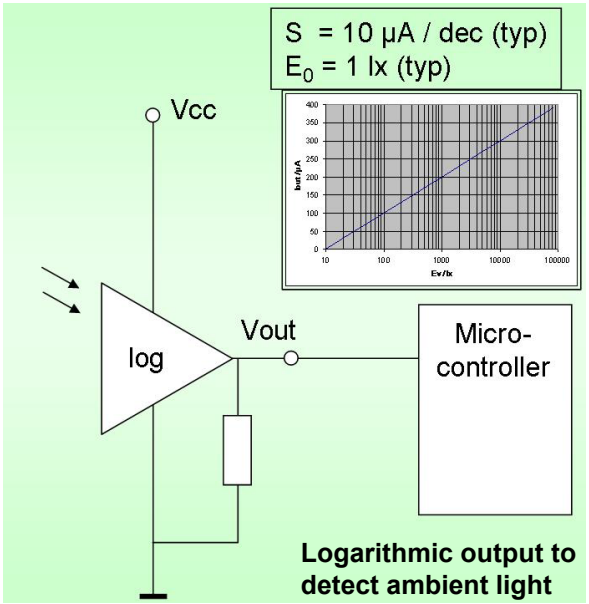
Ambient Light Sensor Products Portfolio

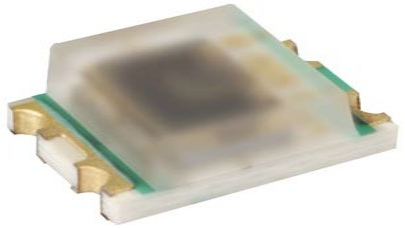
	Phototransistor			Photodiode			Photo-IC	
								
Product name	SFH 3410/R	SFH 3711	SFH 3716	SFH 2430	SFH 2711 A01	SFH 2716 A01	SFH 5701 A01	SFH 5711
Product Brand	**SmartDIL**	**ChipLED**	**ChipLED**	**DIL SMT**	**ChipLED**	**ChipLED**	**ChipLED**	**ChipLED**
Dimension	4,60 x 2,00 x 1,05 mm³	2,00 x 1,20 x 0,80 mm³	2,00 x 1,20 x 0,80 mm³	6,50 x 3,90 x 1,15 mm³	2,00 x 1,20 x 0,80 mm³	2,00 x 1,20 x 0,80 mm³	2,00 x 1,25 x 0,80 mm³	2,80 x 2,20 x 1,10 mm³
Sensitive area	0,29 mm²	0,29 mm²	0,29 mm²	7,02 mm²	0,35 mm²	0,35 mm²	0,11 mm²	0,16 mm²
Photocurrent*	> 160 µA	> 16 µA	> 350 µA	6,3 µA	0,12 µA	1,5 µA	1000 µA	30 µA (log)
Dynamic Range	10 – 100.000 lx	5 – 100.000 lx	5 – 100.000 lx	10 – 100.000 lx	10 – 100.000 lx	10 – 100.000 lx	0,01 – 10.000 lx	3 – 80.000 lx
Dark Current	3 nA	3 nA	3 nA	0,1 nA	0,1 nA	0,1 nA	3 nA	0,1 nA
Capacitance	4 pF	4 pF	4 pF	1000 pF	28 pF	23 pF		3 pF

* Measurements at: V_R=5 V, Std. Light A, E_V= 1000 lx

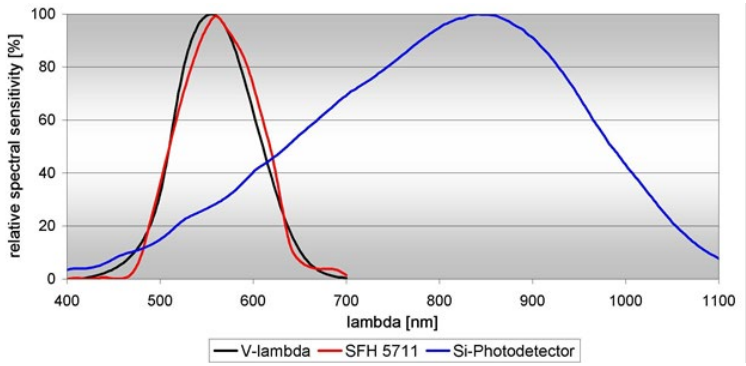
SFH 5711 - High accuracy Ambient Light Sensor

- Perfect v-lambda characteristic – close to human eye response
- III/V-Emitter * (used as PD) + IC for signal amplification
- Continuous dimming steps possible
- Minimal error in light reading for different light sources
- Low temperature coefficient eliminates temperature compensation
- Logarithmic output allows reliable operation over wide illumination range - up to 80K lux
- Supply Voltage (2.3 .. 5)V
- Package (2.2 x 2.8 x 1.1)mm
- Automotive Qualified



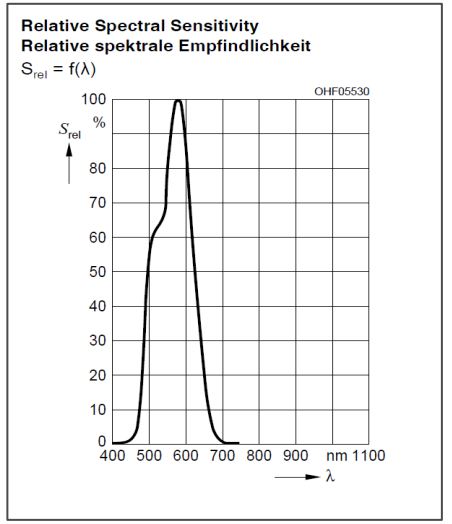


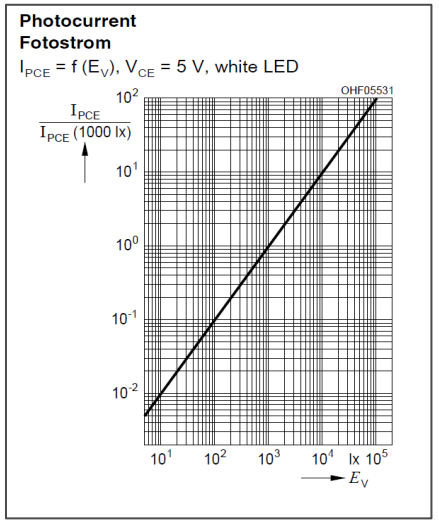
*** A III-V compound semiconductor is an alloy, containing elements from groups III and V of the periodic table**

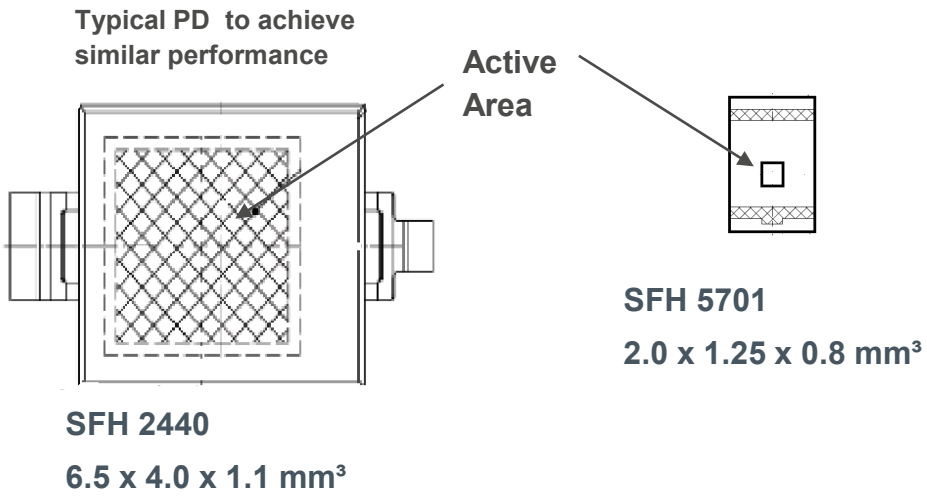


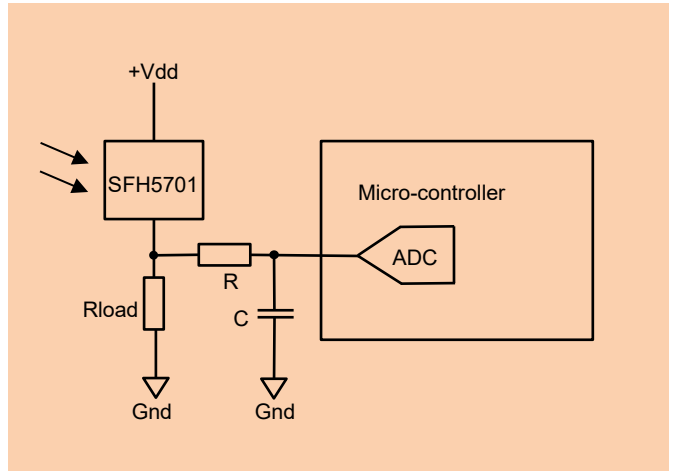
2-Pin Analog ALS – SFH5701 A01

- Simple implementation – just two pins
- Temperature and dark current compensation
- Close to Human eye response
- Excellent IR rejection
- Linear output
- Wide dynamic range: 0.05 lx to 10 klx
- Small footprint (PD vs SFH 5701 size comparison below)
- In mass production









Integrated optical force sensing – SFH 9206

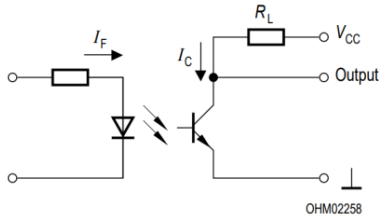
SFH 9206

Reflective Interrupter

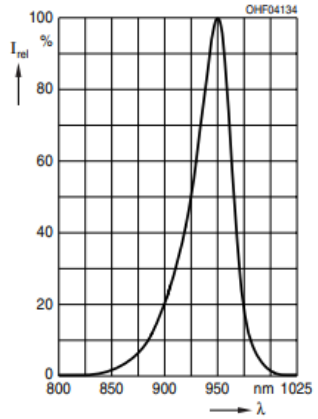
940nm emitter with a silicon NPN phototransistor in a SMT package

Features:

- Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101-REV-C, Stress Test Qualification for Automotive Grade Discrete Semiconductors.
- 4.0 x 6.0 x 1.9mm SMT package
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- 940nm emitter in combination with a silicon NPN phototransistor
- Optimal operating distance 1 mm to 5 mm
- Daylight cut-off filter
- Emitter and detector electrically isolated
- Soldering Method: IR Reflow Soldering
- Product complies to MSL Level 4

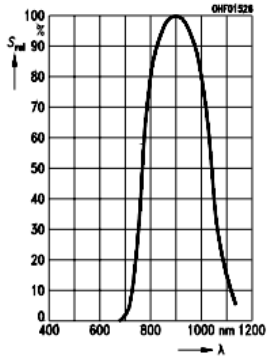


Relative Spectral Emission 1)



Relative Spectral Sensitivity 1), 2)

▪ phototransistor: Srel</sub> = f (λ)

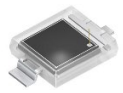
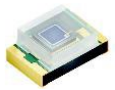


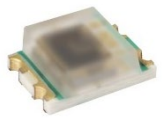
Automotive Detector and Sensor Portfolio

Photodiodes (PD), Phototransistors (PT), ALS Detectors and Sensors

Key products

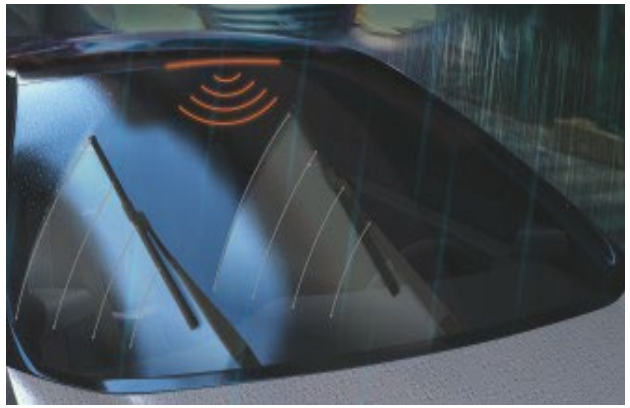
PD	ALS PD	ALS PT	ALS IC	Others
SFH 2200 A01 Broadband 5.1 x 4.0 x 0.85 TOPLED D5140				
SFH 2700FA A01 Broadband + Filter 2.0 x 1.25 x 0.80 ChipLED	**SFH 2770 A01** VLambda 2.0 x 1.25 x 0.80 ChipLED		**SFH 5721** Photopic ALS 2.x 2.0 x 0.5 **Industrial Only**	
SFH 2400 FA Broadband + Filter 4.6 x 2.0 x 1.05 Smart DIL	**SFH 2711/16 A01** VLambda 2.0 x 1.25 x 0.80 ChipLED	**SFH 3711/16** VLambda 2.0 x 1.25 x 0.80 ChipLED	**SFH 5711** VLambda 2.8 x 2.2 x 1.1 ChipLED	
BPW 34 xxS Broadband + Filter 6.5 x 3.9 x 1.15 DIL SMT	**SFH 2430** VLambda 6.5 x 3.9 x 1.15 DIL SMT	**SFH 3410/10R** VLambda 4.6 x 2.0 x 1.05 Smart DIL	**SFH 5701 A01** VLambda 2.0 x 1.25 x 0.80 ChipLED	**SFH 9206** Filter 4.0 x 6.0 x 1.9 Reflective Interruptor




RLS (Rain Light Sensors)

Basics



Rain Light Sensors Requirements

RLS are attached to the windscreen and located behind the rear-view mirror. The sensors perform multiple functions, such as:

- Rain detection and automatic wiper control
- Light detection for automatic switch-on of headlamps or control of display backlighting
- Tunnel detection for automatic headlamp switch when entering/leaving a tunnel

We are market leader in opto components used in rain sensors with a market share of >40%, serving this market for more than 20 years

Recommended Product Families

IRED

TOPLED

- 850 nm and 940 nm
- Reverse mounting available
- AEC Q102 qualified

PowerTOPLED

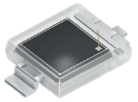
- 850 nm and 940 nm°
- Lens options: +-15° and +-25°
- AEC Q102 qualified

OSLON Piccolo

- Lambertain beam characteristic
- 940 nm
- AEC Q102 qualified

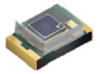
Ambient Light Sensor

DIL SMT



SFH 2430

ChipLED



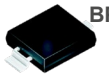
SFH 2716
A01
SFH 3711
SFH 3716

ChipLED based IC

SFH 5701
A01
SFH 5711

Photodiode Detectors

DIL SMT



BPW 34FAS

ChipLED

SFH 2700 FA A01
SFH 2711 A01

Smart DIL

SFH 2400 FA

TOPLED D5140

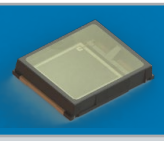
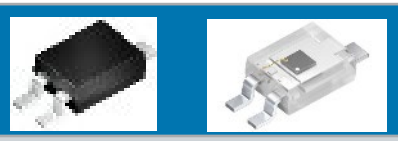
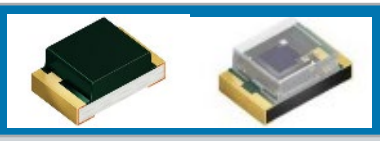
SFH 2200 A01

Low-Power SMD IR LED Portfolio

Device		Part Number	Centroid WL (nm)	Optical Flux (mW)	Radiant Intensity (mW/sr)	Half Angle (deg)	Dimensions (mm)
TOPLED®		SFH 4253 SFH 4253R SFH 4243	850 850 940	40 40 35	13 13 11	± 60 ± 60 ± 60	2.8 x 3.2 x 1.9
Power TOPLED®		SFH 4250 SFH 4240	850 940	60 55	20 18	± 60 ± 60	2.8 x 3.2 x 1.9
Power TOPLED® with lens		SFH 4258 SFH 4259 SFH 4248 SFH 4249	850 850 940 940	70 70 65 65	110 55 100 50	± 15 ± 25 ± 15 ± 25	2.8 x 3.2 x 3.8
Stack Power TOPLED®		SFH 4250S	850	100	30	± 60	2.8 x 3.2 x 1.9
Stack Power TOPLED® with lens		SFH 4258S SFH 4259S	850 850	115 115	185 85	± 15 ± 25	2.8 x 3.2 x 3.8

60

Photodiode Portfolio for Optical Sensing

				
Product name	BPW 34 FAS BPW 34 S	SFH 2200 A01	SFH 2400 FA SFH 2400	SFH 2700 FA A01 SFH 2700 A01
Product Brand	DIL SMT	TOPLED D5140	SmartDIL	ChipLED
Dimension	6,50 x 3,90 x 1,15 mm^3	6,50 x 3,90 x 1,15 mm^3	4,60 x 2,00 x 1,05 mm^3	2,00 x 1,25 x 0,80 mm^3
Sensitive area	7,02 mm^2	7,02 mm^2	1,00 mm^2	0,35 mm^2
Photocurrent*	50 µA	46 µA	6,2 µA	3 µA
Dark Current	2 nA	1 nA	1 nA	0,045 nA
Capacitance	72 pF	60 pF	11 pF	4,6 pF

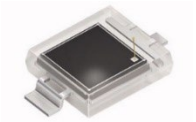
* Measurements at: V_R=5 V, 850 nm, Ee= 1 mW/cm²

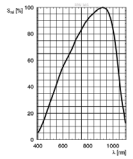
Package size (mm)	2.2 x 3.6 x 1.0mm

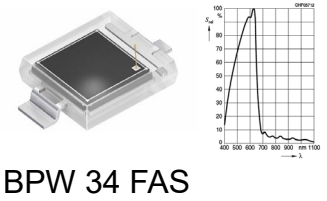
New Product Family TOPLED D5140

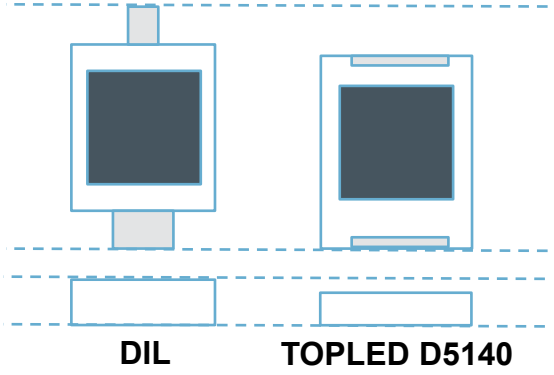
Smaller footprint and increased temperature range compared to DIL products

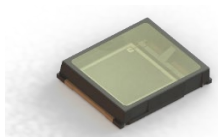
	Package family DIL BPW 34	Package family TOPLED D5140
Footprint (SMT device)	3,9 (4.4) x 6.50 mm² => ~25 mm²	4.0 x 5.1 mm² => ~20 mm² (-20%)
Height	1.15 mm	0.85 mm (-26%)
Leads	supernatant	no supernatant leads
Side	transparent	light blocking
Temperature range	-40° … 100°C	-40°C…125°C
Devices for various spectral ranges	BPW 34 S (broad band) BPW 34 FS (day light filter) BPW 34 FAS (day light filter) SFH 2430 (ALS + IR region)	SFH 2200 A01 (broad band) SFH 2240 A01 ((ALS, V lambda) SFH 2201 A01 (blue enhanced)

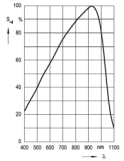

BPW 34 S

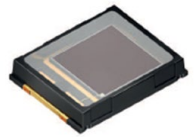


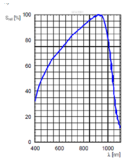

BPW 34 FAS

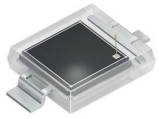


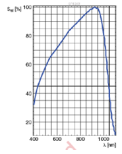

SFH 2200 A01

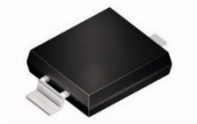


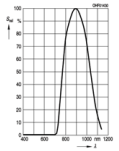

SFH 2201 A01



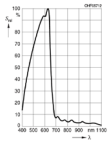

SFH 2401 A01




BPW 34 FAS




SFH 2240 A01



Ambient Light Sensors (ALS)

Basics

Ambient Light Sensors Requirements

ALS are used for automatic display dimming and headlamp switch-on. Their spectral sensitivity corresponds to the characteristics of the human eye. A variety of photosensor technologies are available like phototransistors, photodiodes and photo ICs, the latter with various filter functions and an analog or digital output.

Recommended Product Families

Ambient Light Sensors

Smart DIL

- Phototransistor with good Vλ approximation
- High photocurrent signal
- AEC Q102 qualified

DIL SMT

- Photodiode with good Vλ approximation
- Good linearity and temperature coefficient
- AEC Q102 qualified

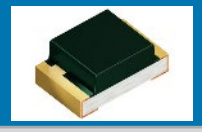
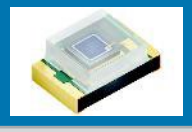
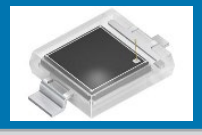
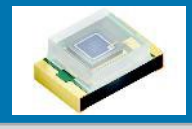
ChipLED

- Photodiode with very good Vλ approximation
- Good linearity and temperature coefficient
- Very small footprint
- AEC Q102 qualified

ChipLED based IC

- Optical filtering, temperature compensation
- Analog output
- Logarithmic output available
- AEC Q102 qualified

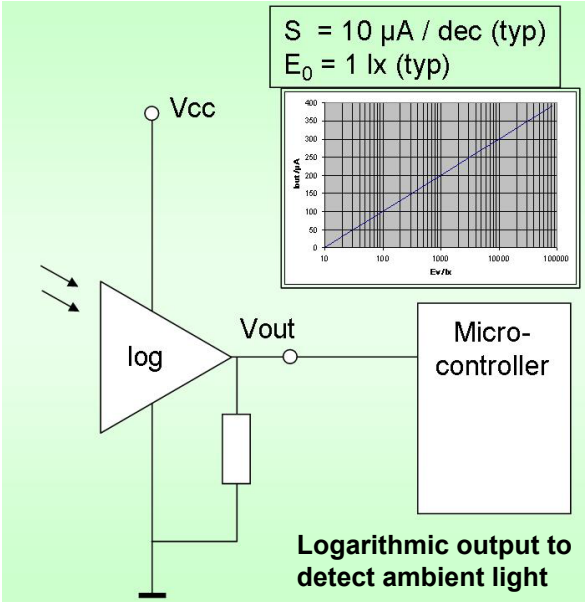
Ambient Light Sensor Product Portfolio

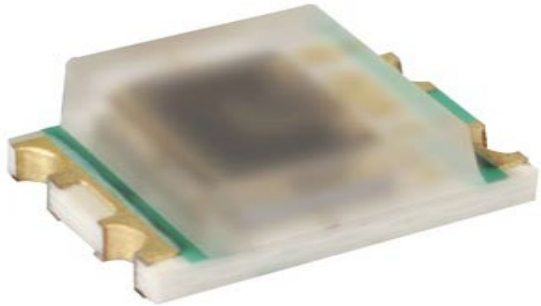
	Phototransistor			Photodiode			Photo-IC	
								
Product name	SFH 3410/R	SFH 3711	SFH 3716	SFH 2430	SFH 2711 A01	SFH 2716 A01	SFH 5701 A01	SFH 5711
Product Brand	**SmartDIL**	**ChipLED**	**ChipLED**	**DIL SMT**	**ChipLED**	**ChipLED**	**ChipLED**	**ChipLED**
Dimension	4,60 x 2,00 x 1,05 mm³	2,00 x 1,20 x 0,80 mm³	2,00 x 1,20 x 0,80 mm³	6,50 x 3,90 x 1,15 mm³	2,00 x 1,20 x 0,80 mm³	2,00 x 1,20 x 0,80 mm³	2,00 x 1,25 x 0,80 mm³	2,80 x 2,20 x 1,10 mm³
Sensitive area	0,29 mm²	0,29 mm²	0,29 mm²	7,02 mm²	0,35 mm²	0,35 mm²	0,11 mm²	0,16 mm²
Photocurrent*	> 160 µA	> 16 µA	> 350 µA	6,3 µA	0,12 µA	1,5 µA	1000 µA	30 µA (log)
Dynamic Range	10 – 100.000 lx	5 – 100.000 lx	5 – 100.000 lx	10 – 100.000 lx	10 – 100.000 lx	10 – 100.000 lx	0,01 – 10.000 lx	3 – 80.000 lx
Dark Current	3 nA	3 nA	3 nA	0,1 nA	0,1 nA	0,1 nA	3 nA	0,1 nA
Capacitance	4 pF	4 pF	4 pF	1000 pF	28 pF	23 pF		3 pF

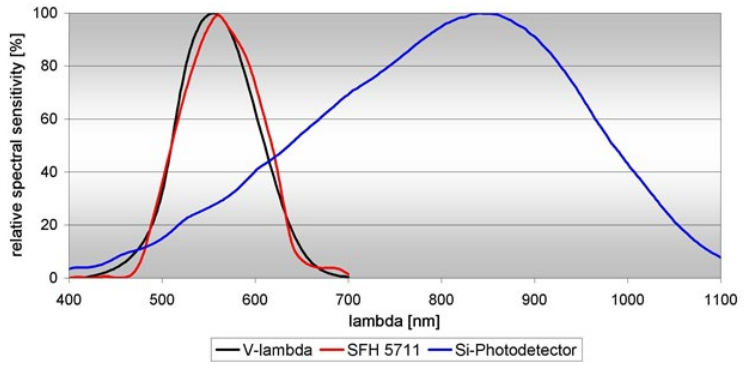
* Measurements at: V_R=5 V, Std. Light A, E_V= 1000 lx

SFH 5711 - High accuracy Ambient Light Sensor

- Perfect v-lambda characteristic – close to human eye response
- III/V-Emitter * (used as PD) + IC for signal amplification
- Continuous dimming steps possible
- Minimal error in light reading for different light sources
- Low temperature coefficient eliminates temperature compensation
- Logarithmic output allows reliable operation over wide illumination range - up to 80K lux
- Supply Voltage (2.3 .. 5)V
- Package (2.2 x 2.8 x 1.1)mm
- Automotive Qualified







*** A III-V compound semiconductor is an alloy, containing elements from groups III and V of the periodic table**

2-Pin Analog ALS – SFH5701 A01

- Simple implementation – just two pins
- Temperature and dark current compensation
- Close to Human eye response
- Excellent IR rejection
- Linear output
- Wide dynamic range: 0.05 lx to 10 klx
- Small footprint (PD vs SFH 5701 size comparison below)
- In mass production