Sense the power of light

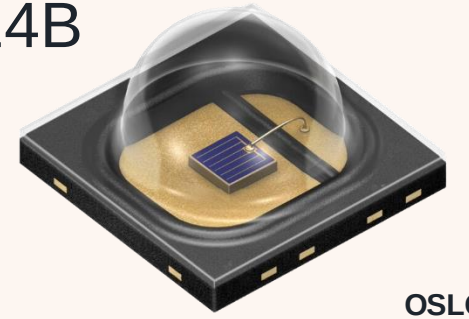
Next generation IR OSLON® Black with new IR:6 Thinfilm Chip technology

SFH 4713B, SFH 4714B, and SFH 47167B

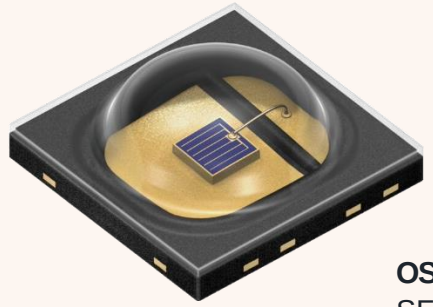
ams-OSRAM International GmbH
September 2024

OSLON® Black – SFH 4713B & SFH 4714B

Now with new IR:6 Thinfilm Chip technology



OSLON® Black
SFH 4713B



OSLON® Black
SFH 4714B

Description

With the development of the new Thinfilm IR:6 Chip technology ams OSRAM increases the value of IR-based applications such as biometric authentication and security cameras, producing brighter IR illumination and image quality while extending battery run-time. Different half angles enable adaption to the needs of the application

Wavelength: 850 nm for high camera sensitivity
Operating temperature: -40 °C till 125 °C
Lens options: ± 40° and ± 75°

Applications

In public or at home, infrared illumination is the perfect solution for security applications

Our infrared LEDs offer the highest reliability to ensure precise biometric identification

Perfect solution for industry, where automation drastically continues to increase

750 µm
Thinfilm Chip technology

+ 25 %
Brightness increase

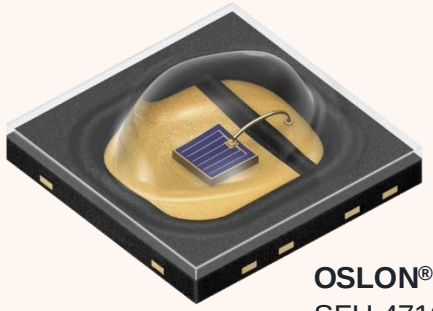
+ 35 %
Efficiency increase

Product Info Page: SFH 4713B: https://ams-osram.com/products/leds/ir-leds/osram-oslon-black-sfh-4713b *
Product Info Page: SFH 4714B: https://ams-osram.com/products/leds/ir-leds/osram-oslon-black-sfh-4714b *

*Go live @official release (22.10.24)

OSLON® Black – SFH 47167B

First IR OSLON® Black with rectangular FoI and new IR:6 Thinfilm Chip technology



OSLON® Black
SFH 47167B

Rectangular FoI* 110° x 135°

Description

With the development of the new Thinfilm IR:6 Chip technology ams OSRAM increases the value of IR-based applications such as biometric authentication and security cameras, producing brighter IR illumination and image quality while extending battery run-time. The special optic of the new OSLON® Black SFH 47167B is shaping a rectangular FoI*, which is a perfect fit to cameras FoV**.

Wavelength: 850 nm for high camera sensitivity
Operating temperature: -40 °C till 125 °C

Applications

In public or at home, infrared illumination is the perfect solution for security applications

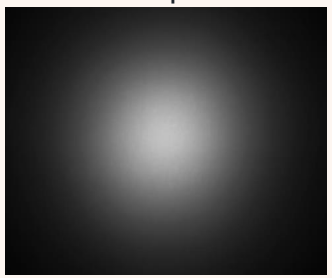
Our infrared LEDs offer the highest reliability to ensure precise biometric identification

Perfect solution for industry, where automation drastically continues to increase

Benefits

Homogeneous lighting in the target area
Optimized for camera-based applications

Round shape FoI



Rectangular FoI

750 µm
New IR:6 Thinfilm Chip technology

235 mw/sr
typ. Radiant Intensity

57,5 %
Efficiency

Product Info Page: SFH 47167B https://ams-osram.com/products/leds/ir-leds/osram-oslon-black-sfh-47167b ***

*Field of illumination ** Field of view *** Go live @official release (22.10.24)

OSLON® Black – Commercial

SFH 4713B, SFH 4714B, and SFH 47167B

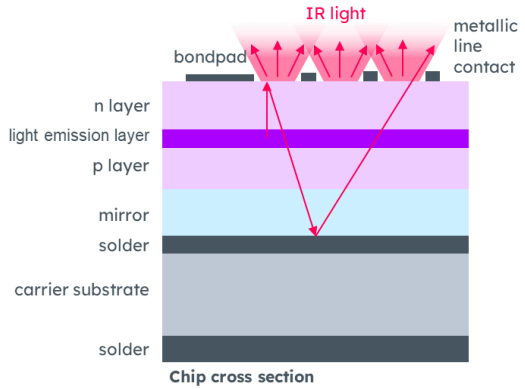
ams-OSRAM International GmbH
September 2024

The new IR:6 Thinfilm Chip technology

What's new?

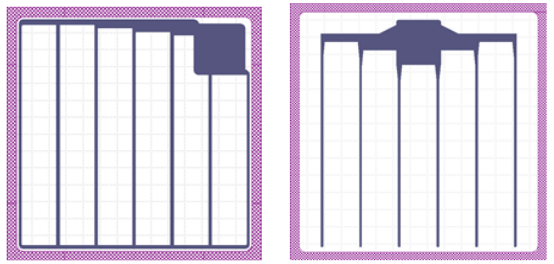
25 % brightness increase

- Adjustments on chip surface for better light outcoupling
- Improvement on internal chip reflectivity and chip mirror design



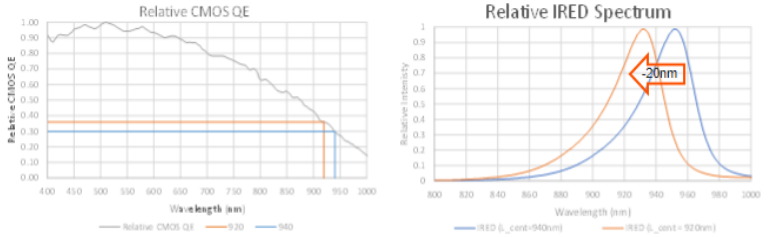
35 % efficiency increase

- Improved n-contact (bond pad) design
- Improved current spreading across the device and lower forward-voltage



New 920 nm version

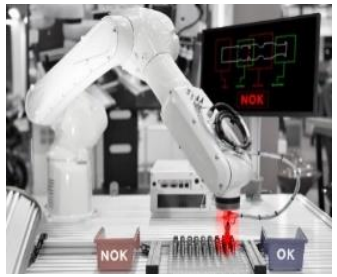
- Improved WL steering to offer 920nm in addition to 850, 940nm
- Higher sensibility of typically used Image Sensor



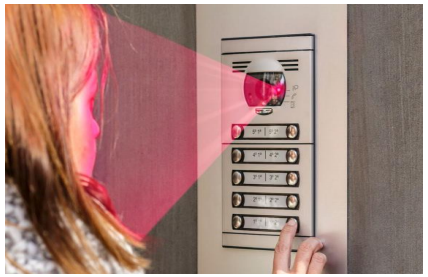
OSLON® Black – The new generation

Different power and wavelengths options to address respective applications

Industrial Security | **NPR & Toll Systems** | **Machine Vision**



Smart Doorbell & Babycams



2D Face Authentification

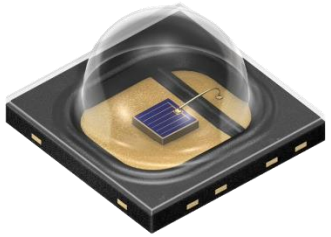
	Camera sensitivity 35%*	Camera sensitivity 20%*	Camera sensitivity 15%*
	Red glow**	Perfect trade off sensitivity & red glow	Reduced red glow**
	850 nm	**920 nm**	**940 nm**
Distance to target	> 150 m / 5 - 100 m	1 - 5 m	< 1 m
Total infrared Power by light source	> 10 W / >> 2 W	~ 100 mW - 2000 mW	
Proper Beam-Shape by IRED or secondary optic lens	+/- 3 ~ 5° / +/- 5 ~ 10°	Circular 150° Rectangular 100°x140° Rectangular 110° x 135°	+/- 50 ~ 60°

* highest sensitivity @ 550nm 100% ** based on human eye sensitivity

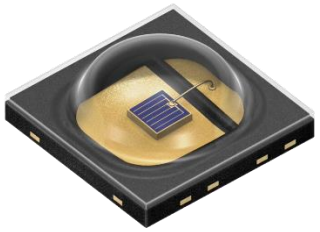
The new IR OSLON® Black

What's new?

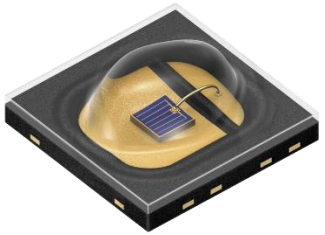
Key Feature	Benefit
1 **Higher optical power:** SFH 4713B / SFH 4714B - **up to 25 %** SFH 47167B – new IR:6 chip included as well	Brighter image Increased lighting homogeneity in target area
2 **Higher WPE:** SFH 4713B / SFH 4714B - **up to 35 %** SFH 47167B – same WPE as SFH 4714B	System energy saving for cameras Longer standby time for battery
3 **Standard package size 3.75 x 3.75 mm**	Easy SMT replacement for existing OSLON® Black packages
4 **High robustness**	Long lifetime Less risk for customer's product quality issue
5 **All in-house: from chip to package**	Clear traceability of all production steps Better cost control for most cost-effective solution



OSLON® Black
SFH 4713B



OSLON® Black
SFH 4714B

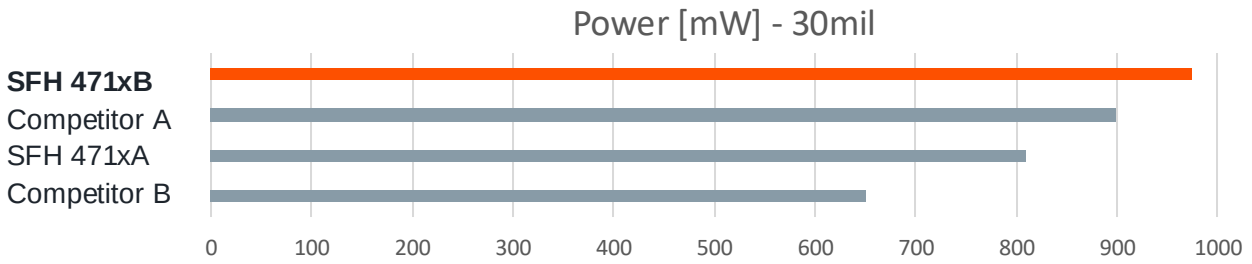


OSLON® Black
SFH 47167B

OSLON® Black – The new generation

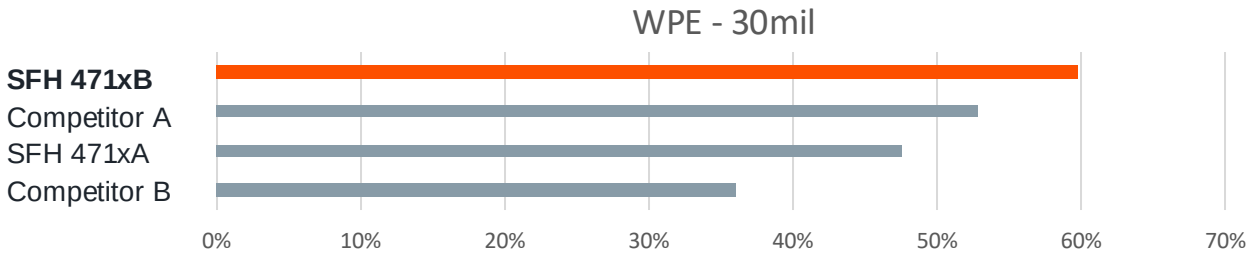
Combining superior brightness, efficiency, price performance in one product

Flux [mw]



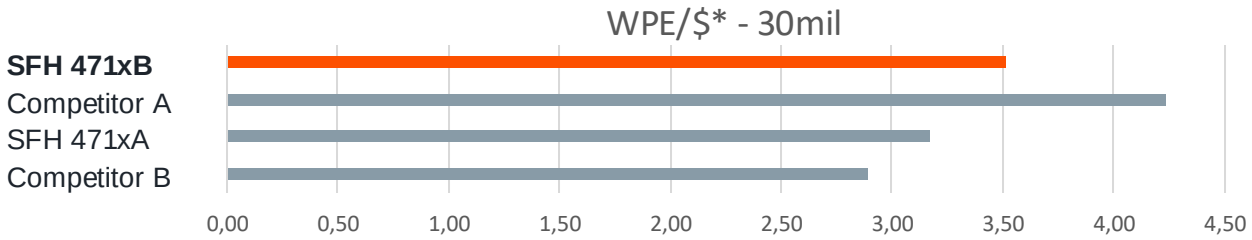
Outperforming

Efficiency [WPE]



Outperforming

Price/Performance [€/W]



Competitive

IR High Power - Evaluation Kit

A simple way to test your application using AS1170 + IR High Power LEDs and VCSEL

Key Features

AS1170 EVK Concept

- AS1170 to drive 4x SFH41747 P1616 LEDs
- Additional LED options accessible via J1 and LED adapter PCBs

GUI Software included

- PC GUI Software to control AS1170 register set and configure device via USB

High current mode

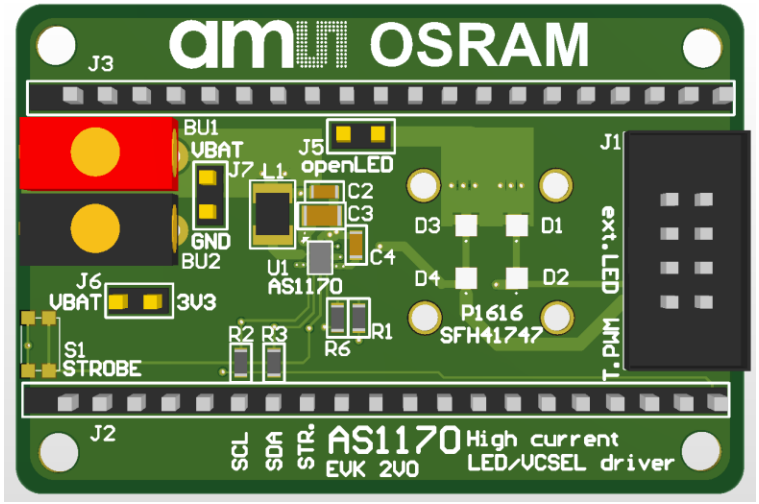
- Connectors available to apply lab power supply for high current mode
- LED Current < 400 mA can be directly driven with included USB cable

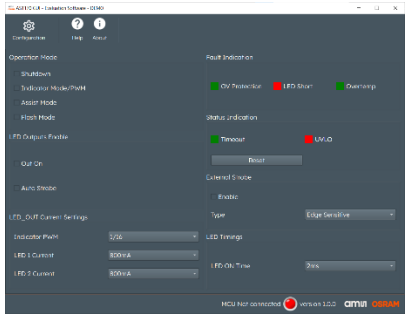
Evaluation package includes

- AS1170 EVK with pre-assembled LEDs
- MCU Board
- GUI Software
- LED break-out boards to be connected via J1 for customer specific setups

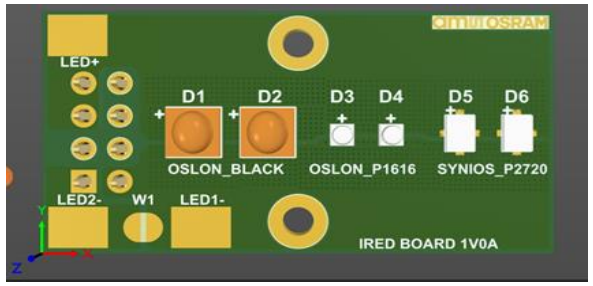
Block Diagram

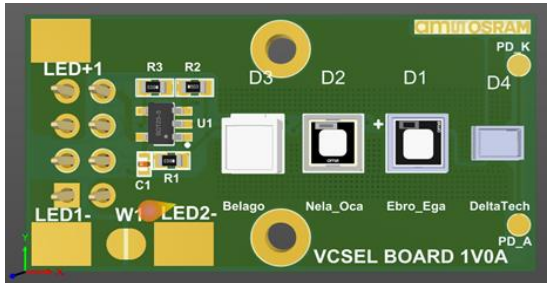
Mainboard with pre installed AS1170 & 4x SFH 41747





GUI Software





Break-out boards for further testing with different LED and VCSEL options

Why to chose ams OSRAM?

Thriving on innovation to improve people's lives by leveraging our technology strengths, experience and innovation

Only supplier on the whole market **to offer all Infrared technologies** – IRED, EEL*, VCSEL** (Dot and Flood)

110+ years of design and manufacturing experience with 3 focus area: **sensing, illumination, visualization**

Technological leading **expertise** in epi, chip and package technology, with **15,000 patents** and patent applications

Quality and **system** solution **support** from product design till end-user application

Co-branding program: ams OSRAM is strong brand in several industries and will boost your business

 *Edge Emitter Laser ** Vertical Cavity Surface Emitting Laser

Sensing is life

OSLON® Black – Product Details

SFH 4713B, SFH 4714B, and SFH 47167B

ams-OSRAM International GmbH
September 2024

IR High Power – The most comprehensive portfolio

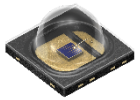
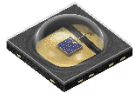
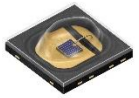
One partner to cover all needs

Ie typ. mW/sr @ 1A	25°		30°	35°		40°		60°		65°		75°		100°x140° Full angle		110°x135° Full angle	Half angle °
1400																	
1200	SFH **x** 4717AS	SFH **x** 4727AS	SFH **x** 4795BS			SFH 4715AS **x**	SFH 4725AS **x**										
1000				SFH **x** 4171S	SFH **x** 4181BS												
800	SFH **x** 4718A					**x** SFH 4715A	SFH 4713B **x**		SFH 4770S **x**								
600								**x** SFH 4775S			SFH **x** 4182BS	SFH 4714B **x**	SFH 4716AS **x** SFH 4716A		SFH **x** 41847S		
400				SFH **x** 4171				SFH **x** 4170S	SFH **x** 4180BS	SFH **x** 4172			SFH 4726AS **x**	SFH **x** 41747		SFH **x** 47167B	
200																	
	850	920/940	920/940	850	920/940	850	920/940	850	920/940	850	920/940	850	920/940	850	920/940	850	nm

x = typ. value = Launch 10/24 = Launch Q1/25 = Current products; To be updated and launched with new IR:6 Chip in Q1/25

OSLON® Black with new IR:6 Thinfilm Chip technology

Strongly increased brightness and efficiency

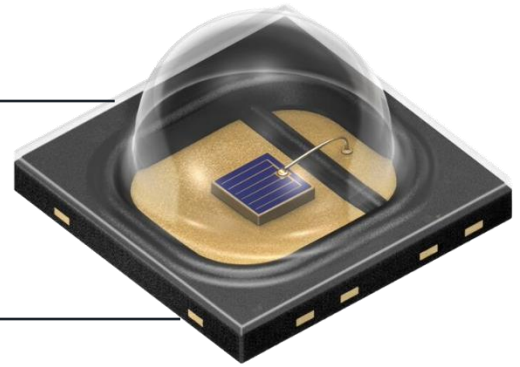
		Wavelength [nm]	+25% Radiant int. [mW/sr]	Radiant Flux. [mW]	+35% WPE [%]	Current [mA]	Max. current [mA]	Voltage typ. [V]	Radiation [°]	Operating [°C]
OSLON® Black SFH 4713B		850	505	975	60	1000	1000	1.63	80	-40 – 125
OSLON® Black SFH 4714B		850	190	940	57.5	1000	1000	1.63	150	-40 – 125
OSLON® Black SFH 47167B		850	235	940	57.5	1000	1000	1.63	110 x 135	-40 – 125

Note: typical values at binning condition

OSLON® Black – SFH 4713B

Fact sheet

Product	**SFH 4713B**
Brand	**OSLON® Black**
Status	**Pre Production**



Characteristics

	SFH 4713B
Application	Industrial Security & Access Control
Power class	High Power
Centroid Wavelength [nm]	850
Radiant intensity typ. [mW/sr]	505
Radiant flux typ. [mW]	975
WPE [%]	60
Binning current I_F [mA]	1000
Forward Voltage typ. [V]	1.63
Radiation [°]	80
Real thermal resistance junction/solder point typ. [K/W]	1.9

Maximum ratings

	SFH 4713B
Operating Temperature [°]	-40 – 125
Storage Temperature [°]	-40 – 125
Junction Temperature [°]	145
Forward Current [mA]	10-1000
Surge Current [mA]	2000
ESD (HBM) [kV]	2

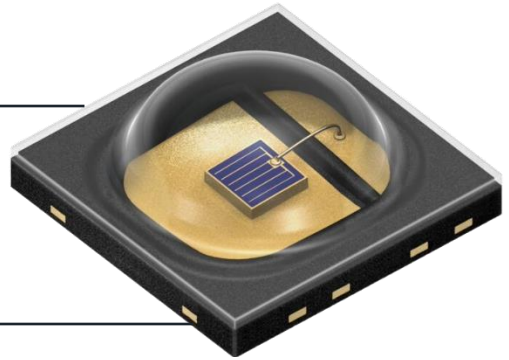
Mechanical and other data

	SFH 4713B
Footprint [mm]	3.75 x 3.75 x 2.29
Package	QFN
Chip Technology	IR:6 Thinfilm
Packing unit [pcs]	600 ; 3000
Reel size	R18 ; R33
ESD diode	no

OSLON® Black – SFH 4714B

Fact sheet

Product	**SFH 4714B**
Brand	**OSLON® Black**
Status	**Pre Production**



Characteristics

	SFH 4714B
Application	Industrial Security & Access Control
Power class	High Power
Centroid Wavelength [nm]	850
Radiant intensity typ. [mW/sr]	190
Radiant flux typ. [mW]	940
WPE [%]	57.5
Binning current I_F [mA]	1000
Forward Voltage typ. [V]	1.63
Radiation [°]	150
Real thermal resistance junction/solder point typ. [K/W]	1.8

Maximum ratings

	SFH 4714B
Operating Temperature [°]	-40 – 125
Storage Temperature [°]	-40 – 125
Junction Temperature [°]	145
Forward Current [mA]	1 – 1000
Surge Current [mA]	2000
ESD (HBM) [kV]	2

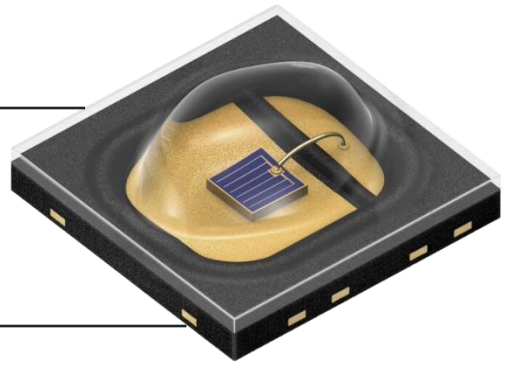
Mechanical and other data

	SFH 4714B
Footprint [mm]	3.75 x 3.75 x 1.51
Package	QFN
Chip Technology	IR:6 Thinfilm
Packing unit [pcs]	600 ; 3000
Reel size	R18 ; R33
ESD diode	no

OSLON® Black – SFH 47167B

Fact sheet

Product	**SFH 47167B**
Brand	**OSLON® Black**
Status	**Pre Production**



Characteristics

	SFH 47167B
Application	Industrial Security & Access Control
Power class	High Power
Centroid Wavelength [nm]	850
Radiant intensity typ. [mW/sr]	235
Radiant flux typ. [mW]	940
WPE [%]	57.5
Binning current I_F [mA]	1000
Forward Voltage typ. [V]	1.63
Radiation [°]	110 x 135
Real thermal resistance junction/solder point typ. [K/W]	1.8

Maximum ratings

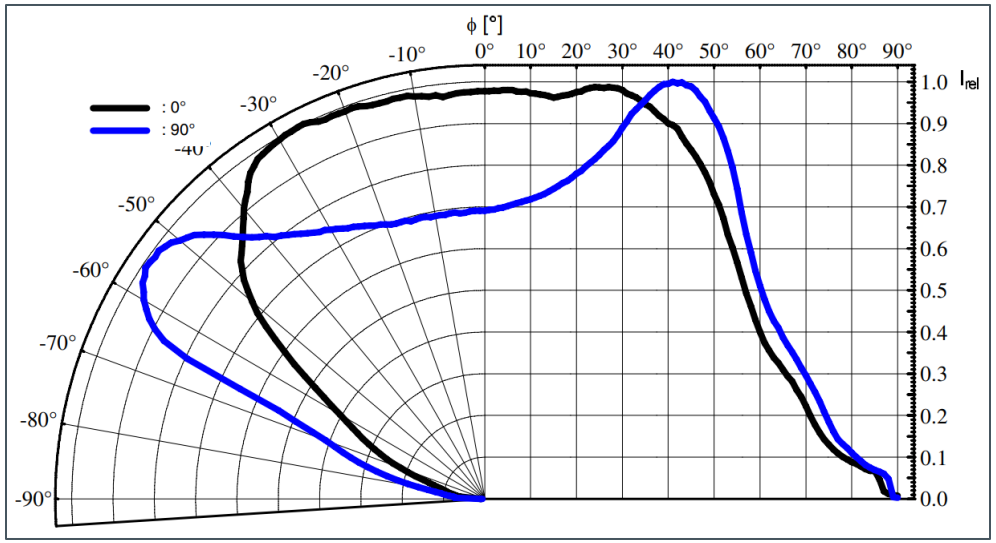
	SFH 47167B
Operating Temperature [°]	-40 – 125
Storage Temperature [°]	-40 – 125
Junction Temperature [°]	145
Forward Current [mA]	10-1000
Surge Current [mA]	2000
ESD (HBM) [kV]	2

Mechanical and other data

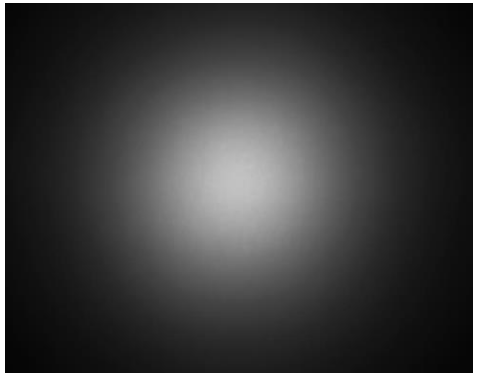
	SFH 47167B
Footprint [mm]	3.75 x 3.75 x 1.53
Package	QFN
Chip Technology	IR:6 Thinfilm
Packing unit [pcs]	600
Reel size	R18
ESD diode	no

OSLON® Black – Rectangular FoI vs round shape FoI

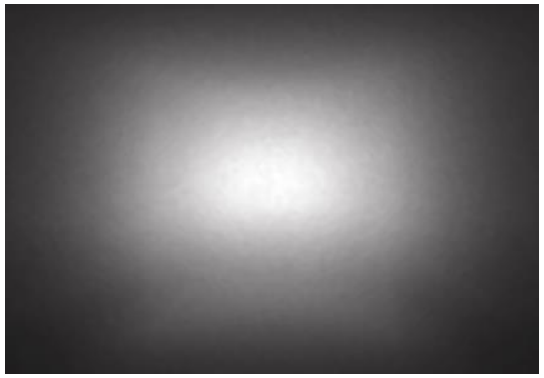
Benefits of rectangular FoI for camera-based application

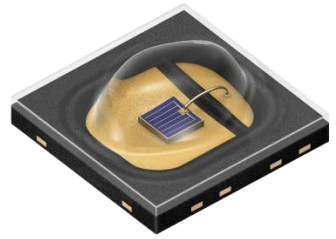


Round shape FoI



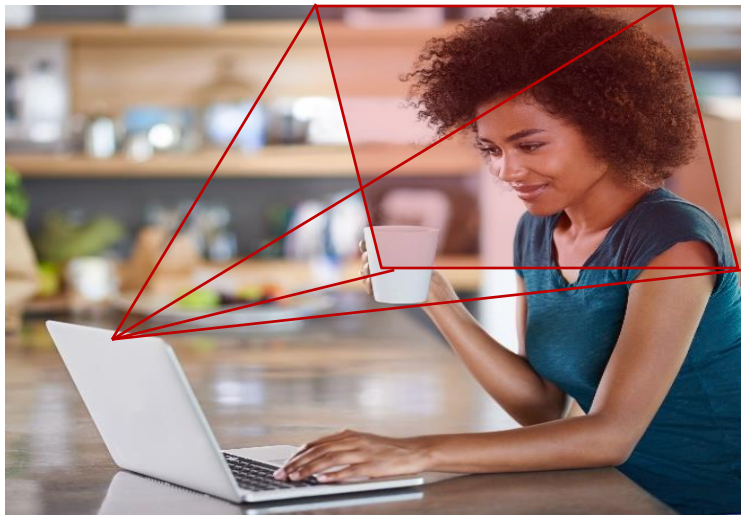
Rectangular FoI





Oslon® Black
SFH 47167B

Benefits of Rectangular FoI



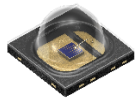
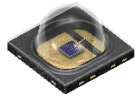
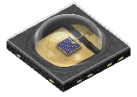
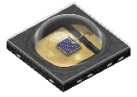
Homogeneous lighting in the target area

Optimized for camera-based applications

Available on industry standard 3,75x3,75 package

OSLON® Black – Details for samples orders

Available as of 24.09.2024

		Q-Number	Manufacturer part number - long version
OSLON® Black SFH 4713B		Q65113A4970	SFH 4713B
OSLON® Black SFH 4713B		Q65113A4971	SFH 4713B R33
OSLON® Black SFH 4714B		Q65113A4979	SFH 4714B
OSLON® Black SFH 4714B		Q65113A4978	SFH 4714B R33
OSLON® Black SFH 47167B		Q65113A7016	SFH 47167B

Note: Samples are only available for order as of 24.09.2024

OSLON® Black – Use Cases

SFH 4713B, SFH 4714B, and SFH 47167B

ams-OSRAM International GmbH
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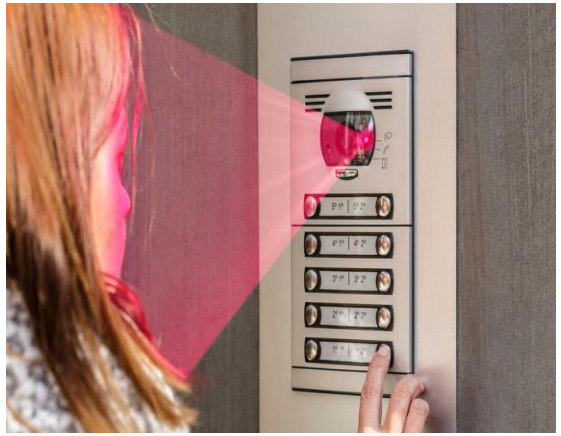
Industrial and consumer security

Make your home and public places safer with Infrared High Power LEDs

Use case: Security & Home cameras



Background of the application

High Power Infrared LED to illuminate the target area of the camera for day and night usage of the application

850 nm for high camera sensitivity, 20 % higher compared to 940 nm

Increase the security and safety feeling of people during their daily life

What are the requirements for this use case?

High radiant intensity on device level for good picture quality

Various field of illumination options for different distances

High efficiency for system energy saving

Reliable and high-quality components due to security critical end applications

Proven Health benefits

Boost wellbeing with the help of Infrared Light

Use case: Health & Wellbeing

Background of the application

- Bring sunlight indoors and make it available during people’s daily life
- Staying healthy in an urbanizing and busy world is a challenge
- Implement the application in daily routines of the user

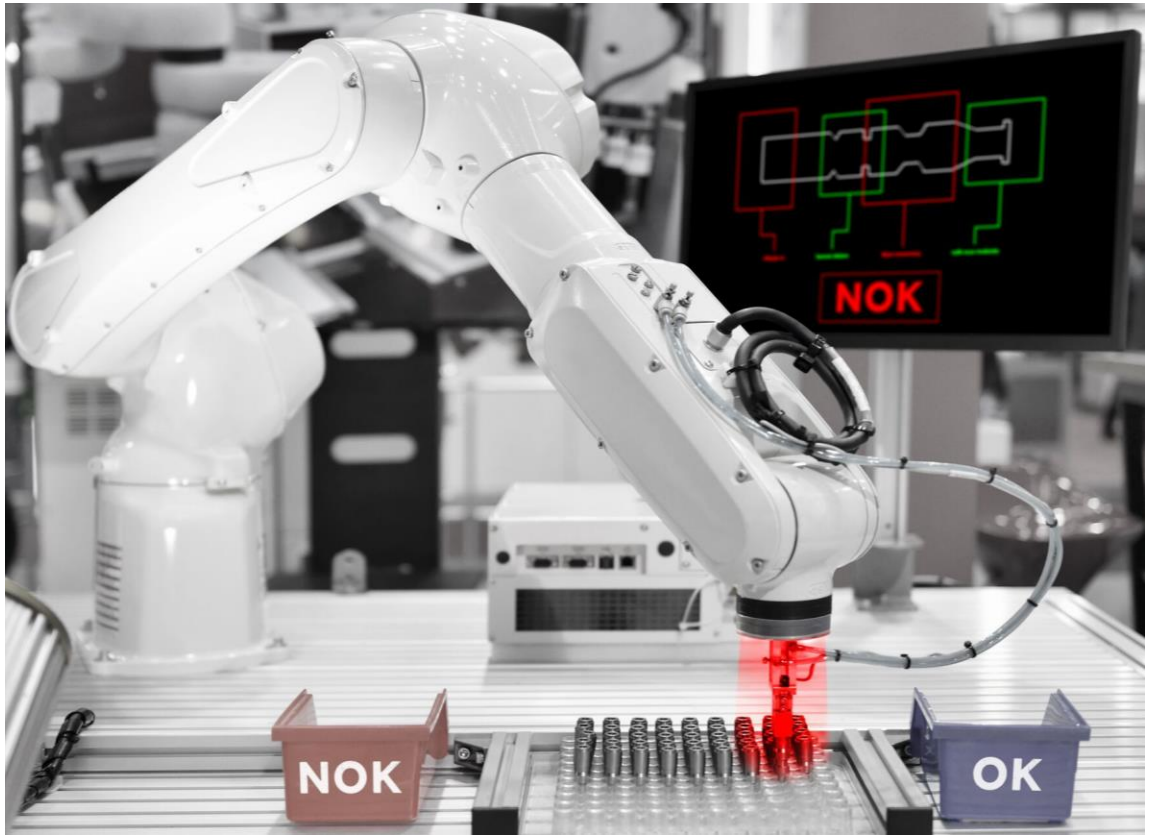
What are the requirements for this use case?

- High efficiency parts needed due to specific algorithm and component driving
- Good pulse handling capabilities per device
- High-quality components for various operating conditions

Industry / Multi markets

Optimize your production process by adding Infrared Illumination to your system

Use case: Machine Vision



Background of the application

- Lighting unit of the machine vision system needs flexible setup with complete light spectrum
- Dependent from the analyzed material / object, different wavelengths are needed
- Automatization and machine vision is heavily increasing in many industries

What are the requirements for this use case?

- Same package options for different colors and wavelengths make it easy for clustering
- Long time availability of parts due to industry qualification processes and application lifetime
- High radiant intensity and good pulse handling capability of the components due to specific driving conditions

Biometric Authentication

Unlocking your device by 2D face recognition

Use case: 2D authentication

Background of the application

- Infrared LED to illuminate and light up the target area
- LED size needs to fit the trend of different bezel sizes (4 mm - 2.5 mm)
- Distance to target ~ 75 – 100 cm

What are the requirements for this use case?

- High radiant intensity on device level for good picture quality
- Wide or rectangular FoI for homogeneous lighting inside target area
- High WPE for system energy saving
- Industry standard package for easy SMT placement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