

Sense the power of light

ams OSRAM

Next generation IR OSOLON® P1616 with new IR:6 Thinfilm Chip technology

SFH 4180BS, SFH 4181BS, and SFH 4182BS

ams-OSRAM International GmbH
September 2024

Public use

OSLON® P1616 – SFH 4180BS, SFH 4181BS, SFH 4182BS

Now with new IR:6 Thinfilm Chip technology

Description

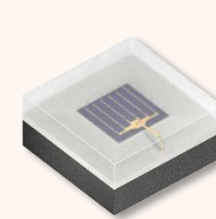
With the development of the new Thinfilm IR:6 Chip technology ams OSRAM increases the value of IR-based applications such as biometric authentication and security cameras, producing **brighter IR illumination and image quality while extending battery run-time.**

The OSLON® P1616 offers an **outstanding power / size ratio** combined with different half angles which enable an adaption to the needs of the application.

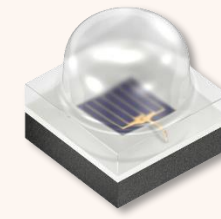
Size: Very compact IR high power emitter with 1.6 x 1.6 mm

Wavelength: 940 nm - reduced red glow compared to 850nm 920nm - the perfect compromise of higher camera sensitivity and red glow appearance for the human eye

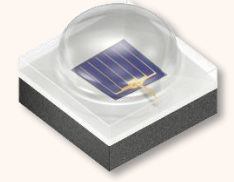
Field of illumination: 70° / 130°



OSLON® P1616
SFH 4180BS

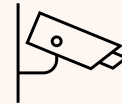


OSLON® P1616
SFH 4181BS



OSLON® P1616
SFH 4182BS

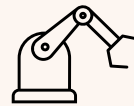
Applications



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, especially where space is limited



Perfect solution for industry, where automation drastically continues to increase

750 μm

Thinfilm Chip technology

+ 35 %

Brightness increase

+ 42 %

Efficiency increase

Product Info Page: SFH 4180BS: <https://ams-osram.com/products/leds/ir-leds/osram-oslon-p1616-lens-sfh-4180bs> *

Product Info Page: SFH 4181BS: <https://ams-osram.com/products/leds/ir-leds/osram-oslon-p1616-lens-sfh-4181bs> *

Product Info Page: SFH 4182BS: <https://ams-osram.com/products/leds/ir-leds/osram-oslon-p1616-lens-sfh-4182bs> *

Sense the power of light

ams OSRAM

OSLON® P1616 – Commercial

SFH 4180BS, SFH 4181BS, and SFH 4182BS

ams-OSRAM International GmbH
September 2024

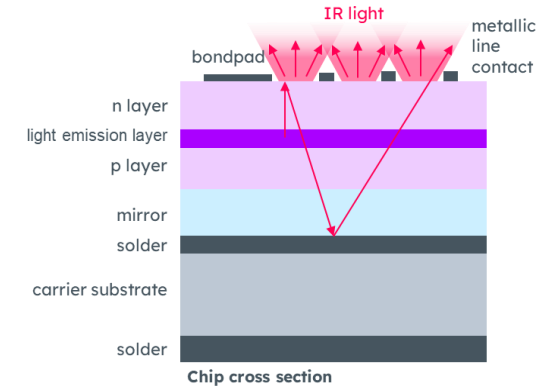
The new IR:6 Thinfilm Chip technology

What's new?



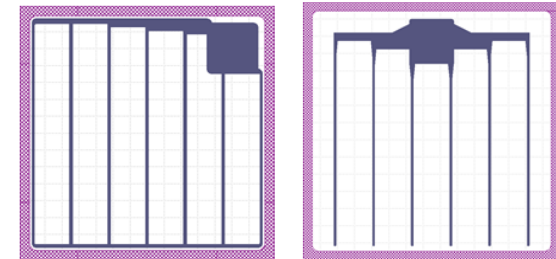
35 % brightness increase

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



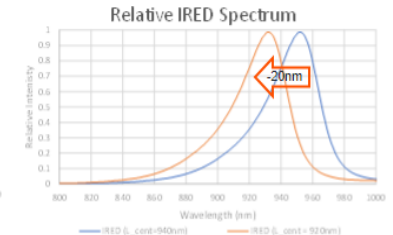
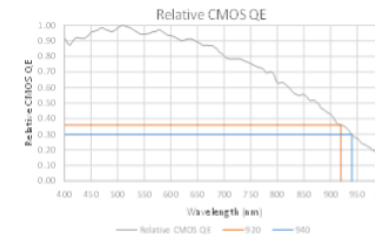
42 % efficiency increase

- 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® P1616 – The new generation

Different power and wavelengths options to address respective applications

Health and Wellbeing



Medical



Oral Scanning



Smart Doorbell & Babycams



2D Face Authentication



Camera sensitivity 35%*

Red glow**

850 nm

Camera sensitivity 20%*

Perfect trade off sensitivity & red glow

920 nm

Camera sensitivity 15%*

Reduced red glow**

940 nm

Distance to target

< 1 m

1 - 3 m

< 1 m

Total infrared Power by light source

~ 100 mW - 1650 mW

~ 100 mW - 1650 mW

~ 100 mW – 1650 mW

Proper Beam-Shape by IRED or secondary optic lens

Circular 66 – Tophat 130°

Tophat 130°
Rectangular 90° x 140°

Tophat 130°
Circular 66°

The new IR OSOLON® P1616

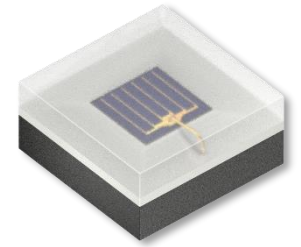
What's new?

Key Feature

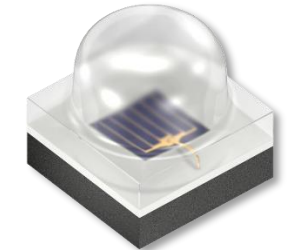
- 1** Higher optical power, up to 35 %
- 2** Higher WPE, up to 42 %
- 3** Smallest package size of 1.6 x 1.6 mm
- 4** High robustness
- 5** All in-house: from chip to package

Benefit

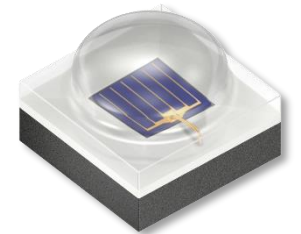
- Brighter image
Better image quality for camera algorithm software
- System energy saving for cameras
Longer standby time for battery
- Smallest and most powerful product on the market
Perfect for narrow space application requirements
- Long lifetime
Less risk for customer's product quality issue
- Clear traceability of all production steps
Better cost control for most cost-effective solution



OSOLON® P1616
SFH 4180BS



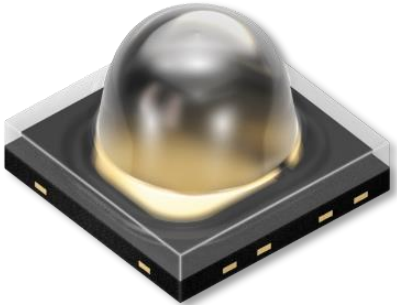
OSOLON® P1616
SFH 4181BS



OSOLON® P1616
SFH 4182BS

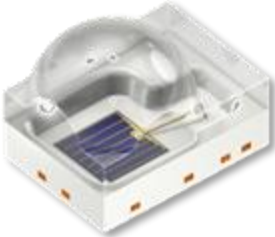
OSLON[®] P1616 – High power & brightness at smallest size

Not even half as wide as a match head



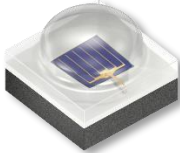
OSLON[®]
Black

100 %
3.75 x 3.75 mm²



SYNOS[®]
P2720

39 %
2.75 x 2.0 mm²



OSLON[®]
P1616

18 %
1.6 x 1.6 mm²



Match
head

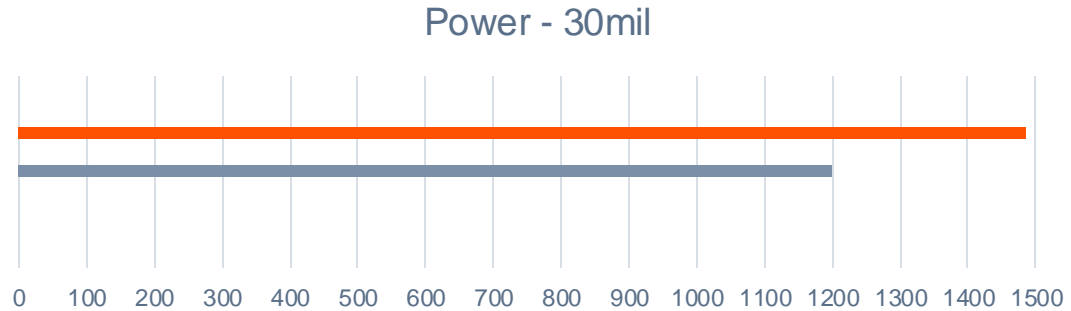
OSLON® P1616 – The new generation

Combining superior brightness and high efficiency in one product



Flux [mw]

SFH 4180BS
Brightek DS value*

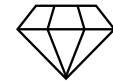
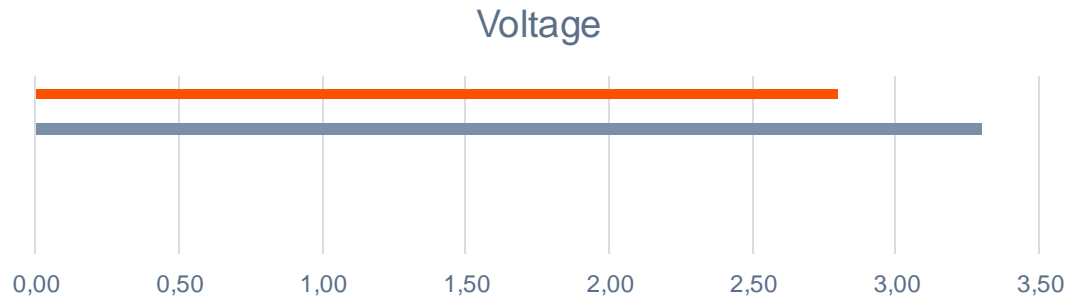


Outperforming



Voltage [Vf]

SFH 4180BS
Brightek DS value*

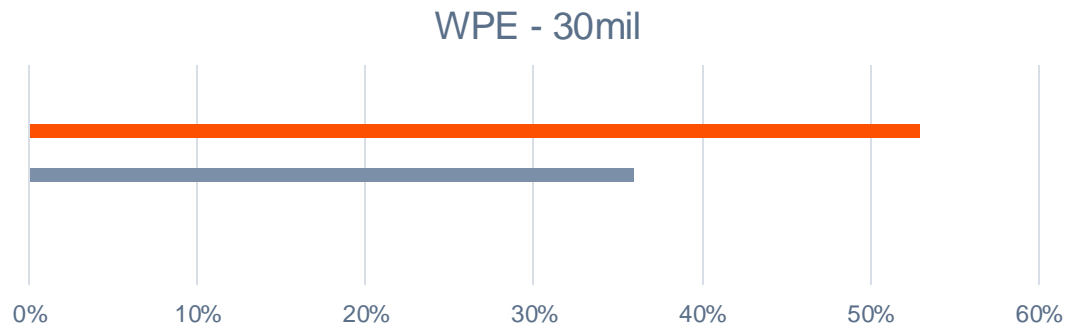


Outperforming



Efficiency [%]

SFH 4180BS
Brightek DS value*



Outperforming

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

OSLON[®] P1616 – Product Details

SFH 4180BS, SFH 4181BS, and SFH 4182BS

IR High Power – The most comprehensive portfolio

One partner to cover all needs

le 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											
800	SFH x 4718A		SFH x 4171S	SFH x 4181BS	SFH 4713B x						
600						SFH 4770S x					
400			SFH x 4171	SFH 4715A x	SFH 4775S x	SFH x 4180BS	SFH x 4182BS	SFH 4714B x	SFH 4716AS x	SFH 4726AS x	
200					SFH x 4170S	SFH x 4172	SFH x 4174	SFH x 4176A	SFH x 41747	SFH x 41847S	
	850	920/940	920/940	850	920/940	850	920/940	850	920/940	850	nm

x = typ. value

 = Launch 10/24

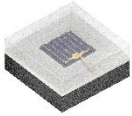
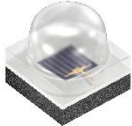
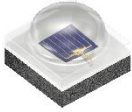
 = Launch Q1/25

 = Current products; To be updated and launched with new IR:6 Chip in Q1/25

OSLON® P1616 with new IR:6 Thinfilm Chip technology

Strongly increased brightness and efficiency

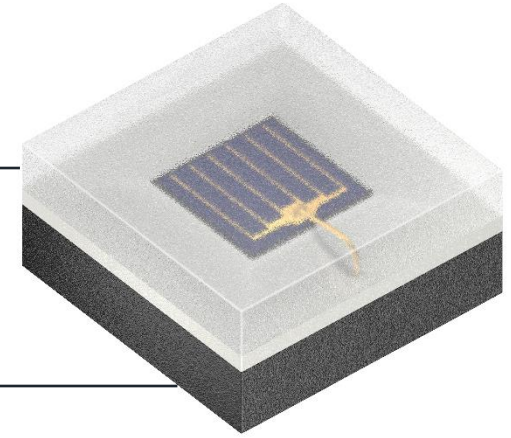
+35% **+42%**

		Wavelength [nm]	Radiant int. [mW/sr]	Radiant Flux. [mW]	WPE [%]	Current [mA]	Max. current [mA]	Voltage typ. [V]	Radiation [°]	Operating [°C]
Oslon® P1616 SFH 4180BS		920, 940	325	1.485	53	1000	1000	2.8	130	-40 - 105
Oslon® P1616 SFH 4181BS		920, 940	765	1.550	55	1000	1000	2.8	70	-40 - 105
Oslon® P1616 SFH 4182BS		920, 940	455	1.650	59	1000	1000	2.8	130	-40 - 105

OSLON® P1616 – SFH 4180BS

Fact sheet

Product	SFH 4180BS
Brand	OSLON® P1616
Status	PROD 



Characteristics (typ.)

	SFH 4180BS
Application	Access control, Industrial Security and Medical
Power class	High power
Centroid Wavelength [nm]	920; 940
Radiant intensity typ. [mW/sr]	325
Radiant flux typ. [mW]	1.485
WPE [%]	53
Binning current I_F [mA]	1000
Forward Voltage typ. [V]	2.8
Radiation [°]	130
Real thermal resistance junction/solder point typ. [K/W]	6.2

Maximum ratings

	SFH 4180BS
Operating Temperature [°]	-40 – 105
Storage Temperature [°]	-40 – 105
Junction Temperature [°]	145
Forward Current [mA]	10 - 1000
Surge Current [mA]	2000
ESD (HBM) [kV]	2

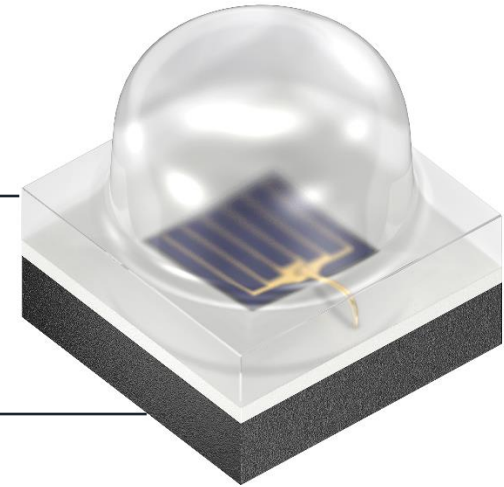
Mechanical and other data

	SFH 4180BS
Footprint [mm]	1.6 x 1.6 x 0.82
Package	ceramic
Chip Technology	IR:6 Thinfilm
Packing unit [pcs]	4000
Reel size	R18
ESD diode	no

OSLON® P1616 – SFH 4181BS

Fact sheet

Product	SFH 4181BS
Brand	OSLON® P1616
Status	PROD 



Characteristics (typ.)

	SFH 4181BS
Application	Access control, Industrial Security and Medical
Power class	High power
Centroid Wavelength [nm]	920; 940
Radiant intensity typ. [mW/sr]	765
Radiant flux typ. [mW]	1.550
WPE [%]	55
Binning current I_F [mA]	1000
Forward Voltage typ. [V]	2.8
Radiation [°]	70
Real thermal resistance junction/solder point typ. [K/W]	5.9

Maximum ratings

	SFH 4181BS
Operating Temperature [°]	-40 – 105
Storage Temperature [°]	-40 – 105
Junction Temperature [°]	145
Forward Current [mA]	10 - 1000
Surge Current [mA]	2000
ESD (HBM) [kV]	2

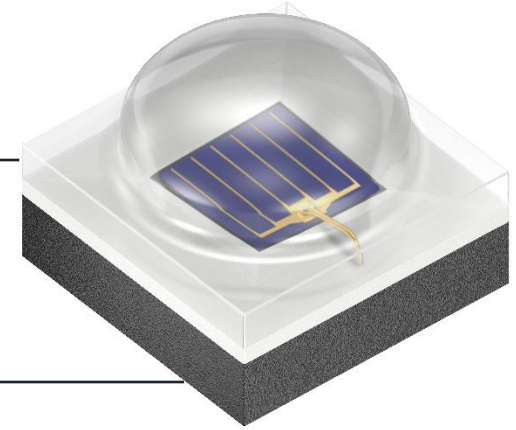
Mechanical and other data

	SFH 4181BS
Footprint [mm]	1.6 x 1.6 x 1.72
Package	ceramic
Chip Technology	IR:6 Thinfilm
Packing unit [pcs]	2000
Reel size	R18
ESD diode	no

OSLON® P1616 – SFH 4182Bs

Fact sheet

Product	SFH 4182BS
Brand	OSLON® P1616
Status	PROD 



Characteristics (typ.)

	SFH 4182BS
Application	Access control, Industrial Security and Medical
Power class	High power
Centroid Wavelength [nm]	920; 940
Radiant intensity typ. [mW/sr]	455
Radiant flux typ. [mW]	1.650
WPE [%]	59
Binning current I _F [mA]	1000
Forward Voltage typ. [V]	2.8
Radiation [°]	130
Real thermal resistance junction/solder point typ. [K/W]	5.9

Maximum ratings

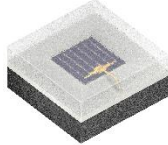
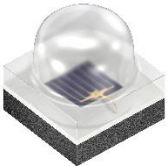
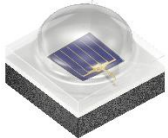
	SFH 4182BS
Operating Temperature [°]	-40 – 105
Storage Temperature [°]	-40 – 105
Junction Temperature [°]	145
Forward Current [mA]	10 - 1000
Surge Current [mA]	2000
ESD (HBM) [kV]	2

Mechanical and other data

	SFH 4182BS
Footprint [mm]	1.6 x 1.6 x 1.33
Package	ceramic
Chip Technology	IR:6 Thinfilm
Packing unit [pcs]	3000
Reel size	R18
ESD diode	no

OSLON® P1616 – Details for samples orders

Available as of 24.09.2024

		<u>Q-Number</u>	<u>Manufacturer part number - long version</u>
Oslon® P1616 SFH 4180BS		Q65113A4988	SFH 4180BS-FA2FB2-11
		Q65113A8781	SFH 4180BS-FA2FB2-1113
		Q65113A8780	SFH 4180BS-FA2FB2-13
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Oslon® P1616 SFH 4181BS		Q65113A4987	SFH 4181BS-DB2EA2-11
		Q65113A8778	SFH 4181BS-DB2EA2-1113
		Q65113A8779	SFH 4181BS-DB2EA2-13
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Oslon® P1616 SFH 4182BS		Q65113A6124	SFH 4182BS-CB2DB1-11
		Q65113A8777	SFH 4182BS-CB2DB1-1113
		Q65113A7976	SFH 4182BS-CB2DB1-13

Sense the power of light

ams OSRAM

OSLON® P1616 – Use Cases

SFH 4180BS, SFH 4181BS, and SFH 4182BS

ams-OSRAM International GmbH
September 2024

Medical

IR light leads to a deeper and more detailed result

Use case: Oral Scanning



Background of the application



Replace conventional plaster cast with new technology



Create more and helpful data during the scanning session (IR light in combination with Laser scanning)



IR Light supports to gather information like: Interdental space analysis, Caries analysis, Inside teeth analysis

What are the requirements for this use case?



High quality standards for medial qualification purposes



LTA availability of components due to market requirements



High radiant intensity on device level for good picture quality



Compact package size with perfect power/size ration

Medical

IR light is beneficial for various applications in the medical area

Use case: IR to support various body healing processes



Background of the application



IR light is beneficial to support cellular functions and is increasing the natural healing processes of the body



Non-invasive treatment is used in a variety of therapeutic applications (e.g. pain / skin treatment)



IR light is not damaging the skin or tissues and can reach depths up to several centimeters



Increase the availability of the IR health approach for home usage applications and clinical setups

What are the requirements for this use case?



High quality standards for medical qualification purposes



LTA availability of components due to market requirements



Good pulse handling capabilities per device

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

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 smaller bezel sizes (~ 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



Super small and powerful package to address narrow space applications

Industrial and consumer security

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

Use case: Smart Doorbell and Babycams



Background of the application



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



940 nm for reduced red glow appearance compared to 850 nm
920 nm as perfect tradeoff between camera sensitivity and red glow



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

am  The logo for 'am' features the lowercase letters 'a' and 'm' in a white, sans-serif font. To the right of the 'm' is a graphic element consisting of a grid of small white dots arranged in a shape that resembles the number '17'.

OSRAM