



## Spotlight higher performance

Inspiring opto components for infotainment and entertainment

**OSRAM**  
Opto Semiconductors



Introducing state-of-the-art technology, brilliant performance and a highly versatile program, OSRAM Opto Semiconductors light and sensing components for infotainment and entertainment applications present our customers with new inspiring opportunities.

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## Preparing the stage for a new world of applications

OSRAM Opto Semiconductors' opto components are perfect for innovative entertainment and information solutions, inspiring designers and manufacturers to create new spectacular visions and exciting applications that will move people all over the world.

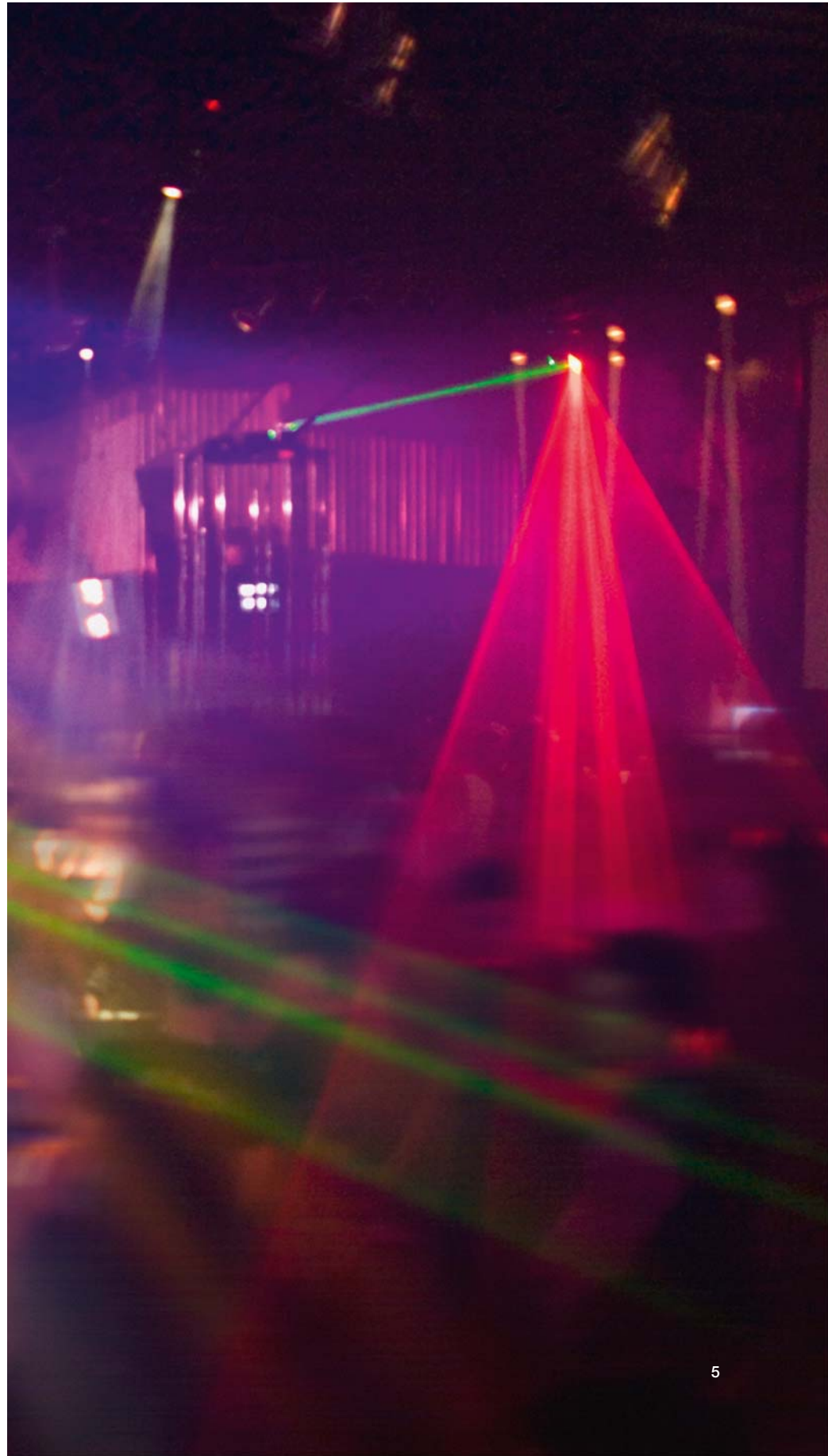
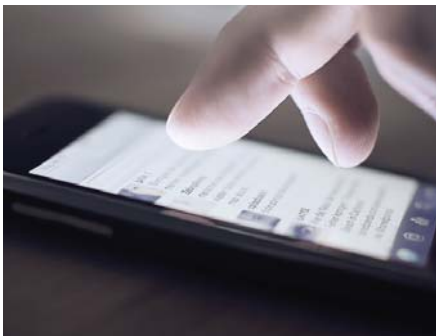
OSRAM Opto Semiconductors delivers a broad portfolio of state-of-the-art LEDs, laser diodes and infrared components, ready to use, designed for your special needs and requirements. All our products offer superior color consistency throughout the whole viewing angle and fully comply with, and in most cases surpass the strictest international standards.

Thanks to our extremely reliable components and the energy efficiency inherent in LED technology, the once unimaginable has become today's reality. Our products combine the competence of nearly 40 years of expertise in the semiconductor industry with 100 years of experience in lighting technology from OSRAM GmbH. We concentrate all opto semiconductor processes under one roof – from chip development, packages and phosphors to finalized components.

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Whether stage lighting, show laser, moving heads, see-through or video walls, gaming, gesture recognition, 3D-TV or eyetracking, billboards or touch-screens – whether high contrast or high efficiency, indoor or outdoor environment, small size or large scale, OSRAM Opto Semiconductors has the perfect solution for the most diversified entertainment, home entertainment and infotainment applications.

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# LEDs and laser diodes for concert halls

Our LEDs and laser diodes offer new opportunities and freedom of design for all kinds of stage lighting, show laser, moving head, see-through and video wall applications. With perfect products in every performance class from OSRAM Opto Semiconductors, the stage no longer has to be simply a means to an end, but can evolve into a spectacle of its own. Important requirements for concert hall illumination and imaging applications are individual addressability of each color, high contrast, high fill factor and high luminance.

## MULTILED®

Individual addressability of each color, high contrast thanks to small reflector size, premium contrast thanks to completely black housing and premium intensity thanks to classic black surface.

## DISPLIX®

Individual addressability of each color, improved fill factor thanks to optimized reflector surface, premium contrast thanks to completely black housing and premium intensity thanks to classic black surface.

## Multi CERAMOS®




Higher power handling capability for creative imaging applications, crossover between imaging and lighting.

## OSRAM OSTAR® Stage


With their much flatter profile the new OSRAM OSTAR® Stage LED provide the basis for compact spotlights with an extremely narrow beam and high luminance. These LEDs are ideal for moveable stage lights, known as moving heads, which provide powerful light beams for rock concerts and other impressive lighting arrangements.

## Visible laser


Their high beam quality, high modulation capability and small form factor make OSRAM blue and green diode lasers ideal as light sources for compact and highly efficient laser systems for stage lighting.

MULTILED®			
			
	LRTB GFTG	LRTB GVTG	LRTB GFUG
Wavelength (nm; typ.)	R: 625 T: 528 B: 470	R: 625 T: 528 B: 470	R: 625 T: 528 B: 470
Intensity in mcd @ 20 mA	R: 650 T: 1300 B: 300	R: 650 T: 1700 B: 300	R: 400 T: 750 B: 200
LED package size in mm	3.3 × 3.4 × 1.8	3.3 × 3.4 × 1.8	3.3 × 3.4 × 1.8
Viewing angle	120°	120°	120°
Package type	white PLCC-6 package, black surface	white PLCC-6 package, black surface	black PLCC-6 package

**DISPLIX®**



**Black LRTB GRUG**

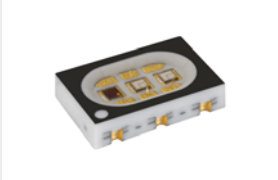


**Blackprint LRTB GRTG**

Wavelength (nm; typ.)	R: 625 T: 528 B: 470	R: 625 T: 528 B: 470
Intensity in mcd @ 20 mA	R: 350 T: 900 B: 180	R: 850 T: 1850 B: 350
LED package size in mm	4.5 × 4.5 × 2.1	4.5 × 4.5 × 2.1
Viewing angle	120°	120°
Package type	black PLCC-6 package	white PLCC-6 package, black surface



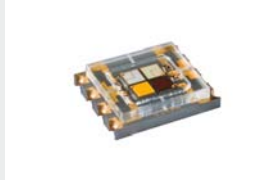
**Multi CERAMOS®**



**LRTB C9TP**

Wavelength (nm; typ.)	R: 625 T: 528 B: 470
Intensity in mcd @ 140 mA	R: 4000 T: 6800 B: 2000
LED package size in mm	4.5 × 3.1 × 0.95
Viewing angle	120°
Package type	ceramic package, black surface

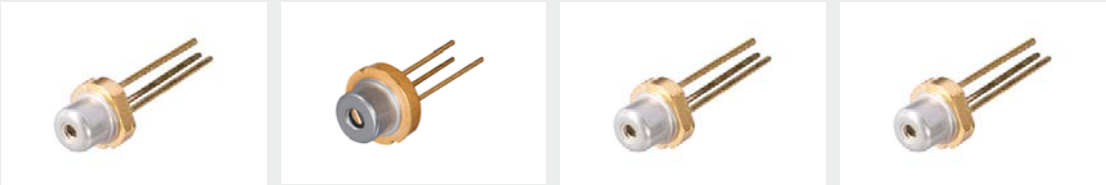
**OSRAM OSTAR® Stage**



**LE RTDUW S2W**

Wavelength (nm; Cx/Cy; typ.)	R: 625 T: 527 D: 453 UW: x = 0.31, y = 0.32
Flux in lm/mW @ 700 mA	R: 71 T: 120 D: 700mW UW: 140
LED package size in mm	4.68 × 5.55 × 1.1
Viewing angle	120°
Package type	compact lightsource in SMT

**Visible laser**



@25 °C	PL 450B	PLTB450	PL 520	PL 515
Output power	80 mW	1.4W	50 mW	30 mW
Emission wavelength typ.	450 nm	450 nm	520 nm	515 nm
Threshold current typ.	30 mA	0.2A	45 mA	50 mA
Operating current typ.	100 mA	1.2A	150 mA	120 mA
Wall plug efficiency	14 %	27 %	5–6 %	5–6 %
Package type	T038 icut	T056	T038 icut	T038 icut

# LEDs for arenas and stadiums

Main screens, perimeter displays and LED TVs are essential applications for arena and stadium information and imaging, with different package sizes and high picture quality for different viewing distances, for example in VIP or inner areas, being the most crucial factors for perfect implementation. In addition to individual addressability of each color, high contrast and high fill factor, here the LEDs also have to be weather-resistant when used outdoors.

## MULTILED®

Individual addressability of each color, high contrast thanks to small reflector size, premium contrast thanks to completely black housing and premium intensity thanks to classic black surface.

## DISPLIX®





Individual addressability of each color, improved fill factor thanks to optimized reflector surface, premium contrast thanks to completely black housing, premium intensity thanks to classic black surface and optimized outdoor stability.

## Multi CHIPLED®

Miniature package design for highest pixel density, perfect for applications with short viewing distances, e. g. VIP areas. Premium contrast thanks to black package design.

## TOPLED®

Classic TOPLED® package with black surface for best message and score readability.

MULTILED®				
				
	LRTB GFTG	LRTB GVTG	LRTB GFUG	LRT GFTM
Wavelength (nm; typ.)	R: 625 T: 528 B: 470	R: 625 T: 528 B: 470	R: 625 T: 528 B: 470	R: 625 T: 528
Intensity in mcd @ 20 mA	R: 650 T: 1300 B: 300	R: 650 T: 1700 B: 300	R: 400 T: 750 B: 200	R: 350 at 10 mA T: 1200 at 20 mA
LED package size in mm	3.3 × 3.4 × 1.8	3.3 × 3.4 × 1.8	3.3 × 3.4 × 1.8	3.3 × 3.4 × 1.8
Viewing angle	120°	120°	120°	120°
Package type	white PLCC-6 package, black surface	white PLCC-6 package, black surface	black PLCC-6 package	white PLCC-6 package, black surface

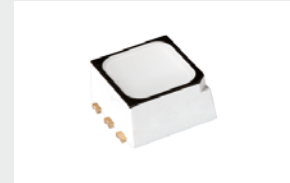




**DISPLIX®**



**Black LRTB GRUG**



**Blackprint LRTB GRTG**

Wavelength (nm; typ.)	R: 625 T: 528 B: 470	R: 625 T: 528 B: 470
Intensity in mcd @ 20 mA	R: 350 T: 900 B: 180	R: 850 T: 1850 B: 350
LED package size in mm	4.5 × 4.5 × 2.1	4.5 × 4.5 × 2.1
Viewing angle	120°	120°
Package type	black PLCC-6 package	white PLCC-6 package, black surface



**Multi CHIPLD®**



**LRTB R98G**

Wavelength (nm; typ.)	R: 625 T: 528 B: 470
Intensity in mcd @ 20 mA	R: 280 T: 350 B: 70
LED package size in mm	1.6 × 1.6 × 0.9
Viewing angle	120°
Package type	black SMT package



**TOPLED®**



**LY T68F**



**LR T68F**

Wavelength (nm; typ.)	589 nm	625 nm
Intensity in mcd @ 20 mA	700	700
LED package size in mm	3.5 × 2.8 × 1.7	3.5 × 2.8 × 1.7
Viewing angle	120°	120°
Package type	white PLCC-2 package, black surface	white PLCC-2 package, black surface

# LEDs for billboards

As LEDs in billboard applications are exposed to very different weather conditions. Their outdoor stability and long lifetime in particular are of elementary importance. Using appropriate products from OSRAM Opto Semiconductors, you can count on both strengths, along with individual addressability of each color and high fill factor.

## DISPLIX®

Individual addressability of each color, improved fill factor thanks to optimized reflector surface, premium contrast thanks to completely black housing, premium intensity thanks to classic black surface and optimized outdoor stability.

DISPLIX®		
	Black LRTB GRUG	Blackprint LRTB GRTG
Wavelength (nm; typ.)	R: 625 T: 528 B: 470	R: 625 T: 528 B: 470
Intensity in mcd at 20 mA	R: 350 T: 900 B: 180	R: 850 T: 1850 B: 350
LED package size in mm	4.5 × 4.5 × 2.1	4.5 × 4.5 × 2.1
Viewing angle	120°	120°
Package type	black PLCC-6 package	white PLCC-6 package, black surface





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DUNKIN' DONUTS  
PACKS ARE HERE.  
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Celebrate

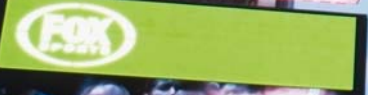


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THE BEST VOICE  
WILL WIN



THE KNOWLEDGE EFFECT



RICO



# Infrared emitters and detectors for touch screens

Touch screens are well established in many consumer applications, which are based on different technologies e.g.: “resistive”, “capacitive” and “projected capacitive”. Naturally OSRAM Opto Semiconductors’ focus is on “optical” touch applications, especially as the advantages of an optical system are more than evident. With larger screens the cost scales up only with the outline (a + b), whereas most other systems scale up with the area (a × b). This is true for example for capacitive systems. And, as no additional layer inside the glass is needed the result is a clearer display and hence a clearer picture. Also optical systems has the advantage to be “used” not only with bare fingers, but also with any stylus, glove, brush, etc. Currently there are three main types of optical touch technology on the market, and OSRAM Opto Semiconductors offers you the right infrared components for each of them.

## Matrix type touch

IR emitters and detectors are placed opposite of each other in the x and y planes to create a grid. The IR light “flows” above the surface of the display.  
Products: SFH 4655, SFH 3605, SFH 4045, SFH 3015 FA

## Camera type touch

An IRED and a camera are mounted in each of the upper corners so only a few higher power components are needed. The IR light “flows” above the surface of the display. For larger screens scaling is achieved with higher power devices.  
Products: SFH 4050, SFH 4655, SFH 4451

## FTIR (frustrated total internal reflection)

The IR light “flows” inside the glass of the display so a bezel free design can be achieved.  
Products: SFH 4053, SFH 3010

### Emitters



SFH 4655



SFH 4451



SFH 4045



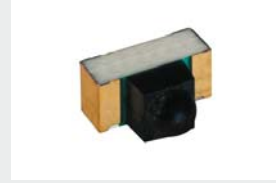
SFH 4053

Package type	<b>MIDLED® Sidelooker</b>	<b>Mini MIDLED®</b>	<b>CHIPLD® Sidelooker</b>	<b>CHIPLD®</b>
Package size in mm	3.1 × 2.25 × 1.6	2.3 × 1.95 × 0.9	3.2 × 2.51 × 1.6	1 × 0.5 × 0.45
Wavelength	850 nm	850 nm	850 nm	850 nm
Typ. radiant intensity, I <sub>e</sub>	65 mW/sr @ 100 mA	60 mW/sr @ 100 mA	90 mW/sr @ 70 mA	6 mW/sr @ 70 mA
Total radiant flux, Φ <sub>e</sub>	60 mW @ 100 mA	55 mW @ 100 mA	40 mW @ 70 mA	40 mW @ 70 mA
Viewing angle	+/-15°	+/-17°	+/-9°	+/-70°

## Detectors



SFH 3605

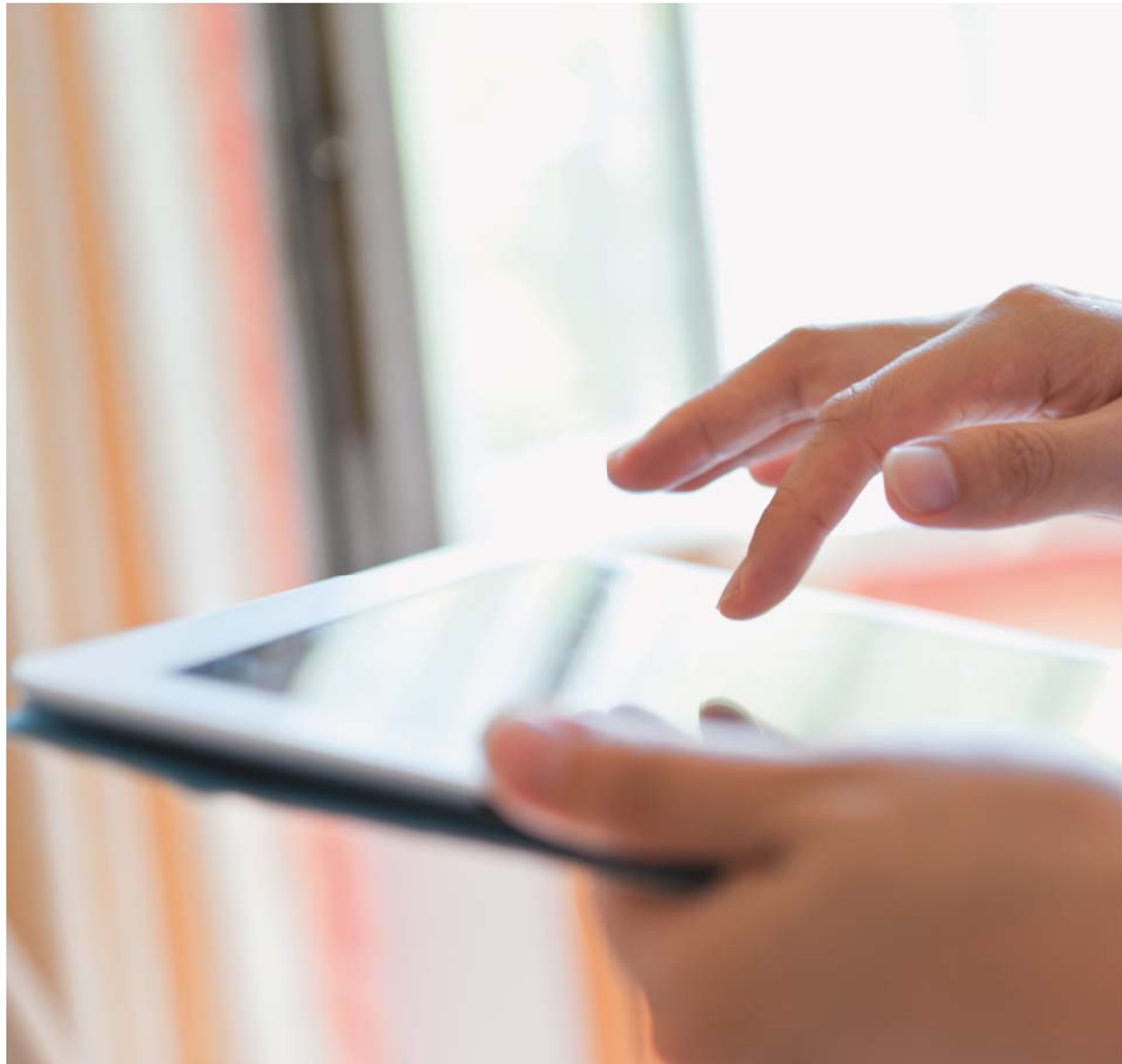


SFH 3015 FA



SFH 3010

Package type	<b>MIDLED® Sidelooker</b>	<b>CHIPLED® Sidelooker</b>	<b>SMARTLED®</b>
Package size in mm	3.1 × 2.25 × 1.6	3.2 × 2.51 × 1.6	1.7 × 0.8 × 0.65
Wavelength of max. sensitivity	990 nm	870 nm	860 nm
Photocurrent ipce	100–500 μA	100–800 μA	> 25 μA
Viewing angle	+/-20°	+/-13°	+/-80°



SFH 4050

**SMARTLED®**

1.7 × 0.8 × 0.65

850 nm

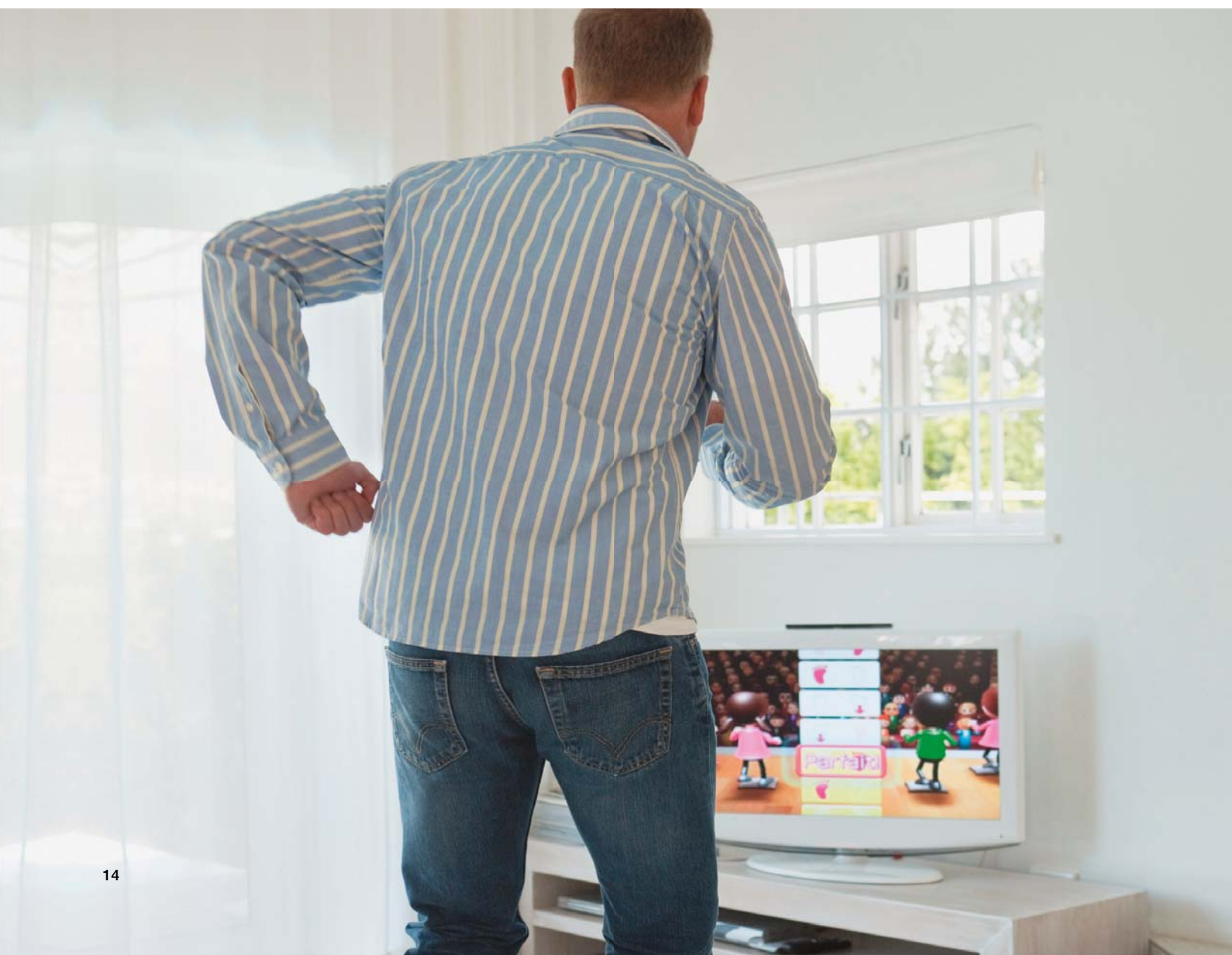
7 mW/sr @ 100 mA

50 mW @ 100 mA

+/-80°

## IREDs and laser for gaming and gesture recognition

Gesture recognition, for example for doctors during surgery, based on time of flight and light grid projection technologies, are some of the most up to date and imminent applications. Time of flight systems use infrared laser diodes or high power infrared emitters as a source; light grid projection systems, such as “Kinect”, need an infrared laser source. Providing solutions for all these technologies, OSRAM Opto Semiconductors is open for discussions to find out your specific demands and develop customized products. The most important requirements here are lifetime and efficiency, both of which we are able to meet perfectly with our ThinFilm technology chips and 30 years of experience in high power laser products.



**Laser**



**SPL LL90 3**



**SPL TD 85-C**

Type	<b>Pulse laser</b>	<b>CW laser diode</b>
Package size in mm	4.9 × 2.4 × 12.2	∅ 5.6 × 3.5
Wavelength	905 nm	845 nm
Opt. peak power	70W	0.45W
Beam divergence	30° × 15°	40° × 6°

**IREDS**



**SFH 4715S**



**SFH 4235**

Package type	<b>IR OSOLON® Black Series</b>	<b>IR DRAGON®</b>
Package size in mm	3.85 × 3.85 × 2.29	11 × 6 × 1.8
Wavelength	850 nm	850 nm
Typ. radiant intensity, I <sub>e</sub>	500 mW/sr @ 1 A	320 mW/sr @ 1A
Total radiant flux, Φ <sub>e</sub>	1070 mW @ 1A	950 mW @ 1A
Viewing angle	+/-45°	+/-60°



# Infrared emitters and detectors for 3D-TV

OSRAM Opto Semiconductors IR emitters such as the SFH 4250S and SFH 4250 Power TOPLED® and IR detectors such as the SFH 235 FA and BPW 34 FAS large scale photo diodes with their integrated daylight cutoff filter are the perfect choice for 3D-TV applications. The infrared LED in the TV set sends a sync signal to the infrared photo diode in the shutter glass. This signal is used to open and close the LCD glass in front of each eye as the relevant picture is displayed on the TV.

## Emitters



SFH 4250S



SFH 4250

Package type	<b>Power TOPLED®</b>	<b>Power TOPLED®</b>
Package size in mm	3.5 × 2.8 × 1.9	3.5 × 2.8 × 1.9
Wavelength	850 nm	850 nm
Typ. radiant intensity, I <sub>e</sub>	22 mW/sr @ 70 mA	20 mW/sr @ 100 mA
Total radiant flux, Φ <sub>e</sub>	70 mW @ 70 mA	60 mW @ 100 mA
Viewing angle	+/-60°	+/-60°

## Detectors



SFH 235 FA



BPW 34 FAS

Package type	<b>T092 Photodiode Sidelooking</b>	<b>SMT Dii Photodiode</b>
Package size in mm	4.85 × 2.85 × 6.9	3.2 × 2.51 × 1.6
Wavelength of max. sensitivity	900 nm	880 nm
Photocurrent ipce typ.	50 μA	50 μA
Viewing angle	+/-65°	+/-60°





# Infrared emitters for eyetracking

Eyetracking is a new and promising feature for consumer applications. It is already being used in niche markets for instance to enable handicapped people to work with a computer. Another current application is to track the eyes of a single viewer to develop glass free 3D laptops, or to control a TV with the eyes.

Many more applications will be realizable in the future, such as interactive point of sale displays or laptop screens, automatically switching to special offers or ads, based on where the viewer is looking – or special study and research devices able to examine which points of a picture are most attractive by capturing what most people focus on at first or for the longest time.



## Emitters



**SFH 4259S**



**SFH 4259**

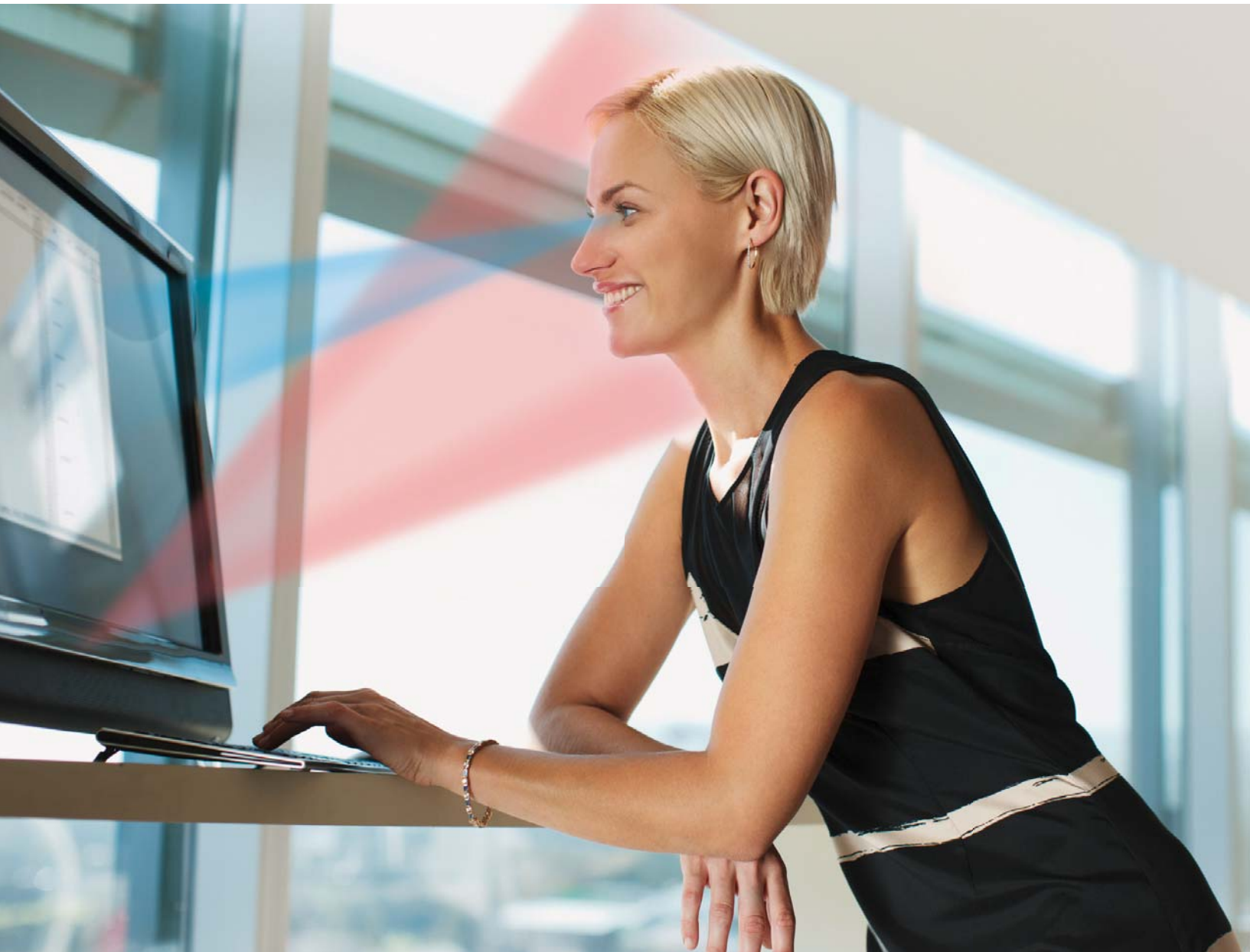


**SFH 4650**



**SFH 4451**

	<b>Power TOPLED® with lens</b>	<b>Power TOPLED® with lens</b>	<b>MIDLED® Sidelooker</b>	<b>Mini MIDLED®</b>
Package type				
Package size in mm	3.5 × 2.8 × 3.5	3.5 × 2.8 × 3.5	3.1 × 2.25 × 1.6	2.3 × 1.95 × 0.9
Wavelength	850 nm	850 nm	850 nm	850 nm
Typ. radiant intensity, I <sub>e</sub>	60 mW/sr @ 70 mA	55 mW/sr @ 100 mA	65 mW/sr @ 100 mA	60 mW/sr @ 100 mA
Total radiant flux, Φ <sub>e</sub>	80 mW @ 70 mA	70 mW @ 100 mA	60 mW @ 100 mA	55 mW @ 100 mA
Viewing angle	+/-25°	+/-25°	+/-15°	+/-17°



SFH 4059S

CHIPLED® with lens

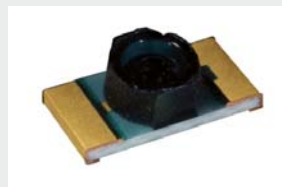
3.2 × 1.6 × 1.85

850 nm

130 mW/sr @ 70 mA

70 mW @ 70 mA

+/-15°



SFH 4056

CHIPLED® with lens

3.2 × 1.6 × 1

850 nm

35 mW/sr @ 70 mA

40 mW @ 70 mA

+/-22°

# Choose perfection – easily

✓ recommendation • alternative recommendation

	LRTB GFTG	LRTB GVTG	LRTB GFUG	LRT GFTM	LY T68G	LR T68F	LE RTDUW S2W OSRAM OSTAR® Stage	LRTB GRTG	LRTB GRUG	LRTB R98G	LRTB C9TP	PL 450B	PLTB450	PL 520	PL 515
			MULTILED®				TOPLED®		DISPLIX®		Multi CHIPLIED®			Visible laser	
<b>Concert hall</b>															
Moving heads							✓								
Show laser												✓	✓	✓	✓
See-through	✓	✓	✓					✓	✓		✓				
Video walls	✓	✓	✓												
<b>Arena and stadium</b>															
Main screen	✓	✓	✓					✓	✓						
Perimeter display	✓	✓						✓	✓						
LED TV										✓					
Scoreboard				✓	✓	✓									
<b>Billboards</b>								✓	✓						
Page	6, 8	6, 8	6, 8	8	9	9	7	7,9,10	7,9,10	9	7	7	7	7	7

## Applications

	High power device or laser	Power TOPLED® family	MIDLED®	Mini MIDLED®	Miniature emitter	Miniature detector
Optical touch-screen						
Matrix type			✓		•	•
Optical touch-screen						
Camera type			✓	✓	•	
Optical touch-screen						
FTIR type					✓	✓
Gesture recognition	✓					
3D-TV		✓				
Eyetracking		✓	•	•		
Page	15, 16	16, 18	12, 18	12, 18	12, 19	12, 13

# Be informed – completely

Looking for more information and data on our products for LEDs in general lighting or LEDs in general? All you need to know about our state-of-the-art products, modern LED technology and the latest LED trends can be found on our website along with other related links.

## [catalog.osram-os.com](http://catalog.osram-os.com)

Our complete product catalog with all available products

## [www.osram-os.com/solid-state-lighting](http://www.osram-os.com/solid-state-lighting)

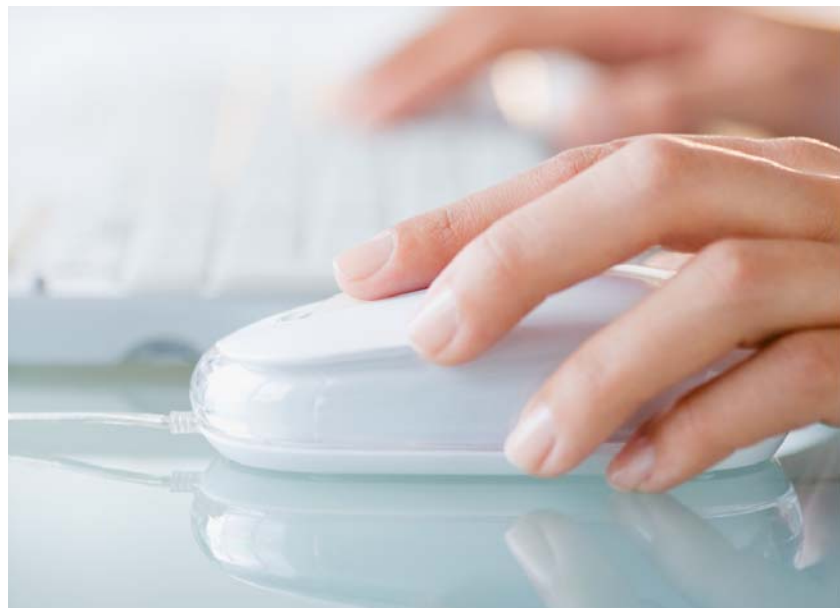
Products and solutions for general lighting/solid state lighting

## [ledlight.osram-os.com](http://ledlight.osram-os.com)

The leading source of LED information, resources, tools, technology & LED lighting solutions for the solid state lighting and general illumination sectors

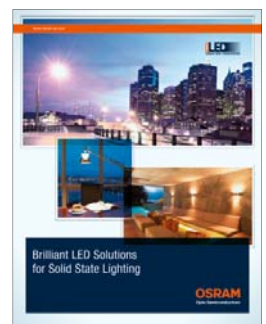
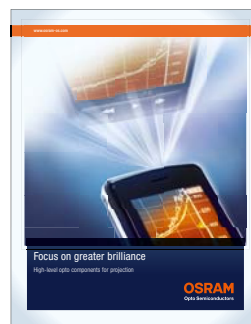
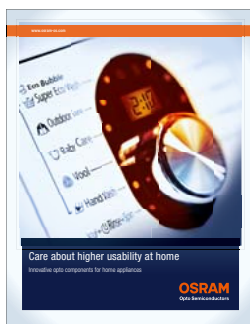
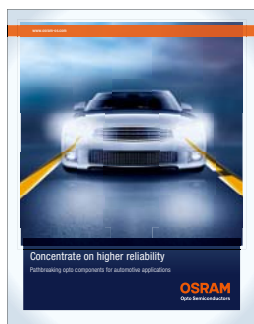
## [www.ledlightforyou.com](http://www.ledlightforyou.com)

The network for LED lighting technology – powered by OSRAM



## Application brochures available from OSRAM Opto Semiconductors

Our innovative products open up a wide variety of applications. Just contact us for assistance with your specific design (for contact information see last page) or order our application brochures: [www.osram-os.com/downloads](http://www.osram-os.com/downloads).



# Bringing your visions to life

OSRAM Opto Semiconductors is one of the world's leading manufacturers of optoelectronic semiconductors and is considered an authority on innovative light technologies. With numerous patented technologies, a deep understanding of customer needs, close customer relations and highly committed employees, we take an active part in shaping the future of light.

## Leader in technology

Because for decades we have been investing in technology and quality, steadily expanding our competencies, OSRAM Opto Semiconductors today sets the highest international standards in the fields of illumination, visualization and sensor technology. Our product range from high-performance light-emitting diodes (LEDs) and infrared diodes (IREDs) to detectors.



### Your partner of choice

OSRAM Opto Semiconductors' close cooperation with our customers and partners generates new ideas for products and light solutions. Not least, these joint efforts have also resulted in an application-specific portfolio for a variety of applications: our semiconductors are used, for instance, in light solutions for automotive, white goods, entertainment and infotainment, projection and general lighting as well as numerous infrared and laser solutions.

### Driver for innovation

Continuous commitment to research and development have established a solid foundation at OSRAM Opto Semiconductors for product development and manufacturing at a consistently high level. We have, for example, turned out pioneering technologies for almost 40 years and hold thousands of patents. Milestones reached in setting numerous standards in LED light technologies include the development of the first surface-mountable LED (TOPLED®), the first LED with white light and the OSRAM OSTAR® product platform with its versatile package design.

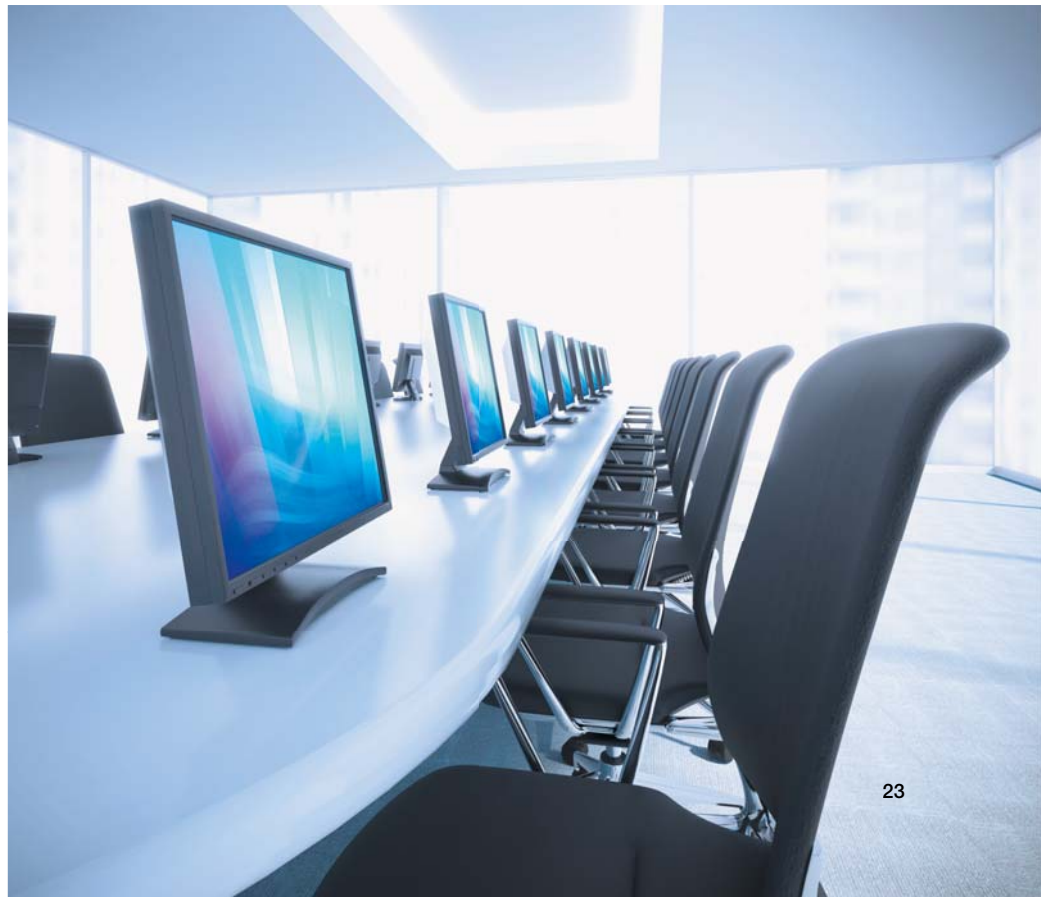



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### Competent light solutions around the globe

By engineering and manufacturing highly complex semiconductor chips and consistently developing new products for new applications, OSRAM Opto Semiconductors is able to satisfy the needs and requirements of customers around the world. With our headquarters in Regensburg (Germany), Sunnyvale (USA) for North America and Hong Kong for Asia, production sites in Regensburg, Penang (Malaysia) and soon in Wuxi (China), some of the most modern LED chip manufacturing facilities in the world, and a global network of sales and marketing centers, we and you are in an excellent position to meet the challenges of today and tomorrow.

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## Sales contacts

### Asia

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