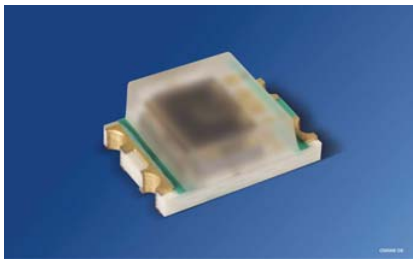
Hochgenauer Umgebungslichtsensor
High Accuracy Ambient Light Sensor
Lead (Pb) Free Product - RoHS Compliant

SFH 5711



Wesentliche Merkmale

- Optohybrid mit logarithmischem Stromausgang
- Perfekt an die Augenempfindlichkeit (Vλ) angepasst
- Niedriger Temperaturkoeffizient der Fotoempfindlichkeit
- Hohe Genauigkeit über weiten Beleuchtungsstärkebereich
- Automotive Freigabe

Features

- Opto hybrid with logarithmic current output
- Perfect match to Human Eye Sensitivity (Vλ)
- Low temperature coefficient of spectral sensitivity
- High accuracy over wide illumination range
- Automotive qualified

Anwendungen

- Anwendungen im Automobilbereich
- Sonnenlichtsensor / Fahrlichtkontrolle
- Steuerung von Displayhinterleuchtungen
- Mobile Geräte

Applications

- Automotive applications
- Sunlight sensor / head lamp control
- Control of display backlighting
- Mobile devices

Typ **Type**	**Bestellnummer** **Ordering code**	**Ausgangsstrom**, E_v= 1000lx, (white LED LW 541C) **Output current**, I_{OUT} / µA
SFH 5711-2/3[1)]	Q65110A4513	27 - 32
SFH 5711-1/2[1)]	on request	25 - 30
SFH 5711-3/4[1)]	on request	29 - 34

[1)] Nur eine Gruppe innerhalb einer Verpackungseinheit, siehe Kenndaten.
Only one bin within one packing unit, see characteristics

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	T_{stg}	– 40 … + 100[1)] – 40 … + 85[2)]	°C
Versorgungsspannung Supply voltage	V_{CC}	6	V
Ausgangsspannung Output voltage	V_{OUT}	< V_{CC}	V
Elektrostatische Entladung Electrostatic discharge Human Body Model according to EOS/ESD-5.1-1993	ESD	2	kV

1) if the device is handled according to JEDEC level 4

2) if the device is handled according to JEDEC level 3

Empfohlener Arbeitsbereich
Recommended Operating Conditions

Bezeichnung Parameter	Symbol Symbol	Wert Value			Einheit Unit
		min.	typ.	max.	
Betriebsspannung Supply voltage	V_{CC}	2.3		5.5	V
Beleuchtungsstärke Illuminance T_A = – 30 °C ... + 70 °C T_A = – 40 °C ... + 100 °C	E_V		 3 ... 80k 10...80k		lx

Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**			**Einheit** **Unit**
		min.	**typ.**	**max.**	
Stromaufnahme, E_V = 0 Current consumption V_{CC} = 2.5 V V_{CC} = 5.0 V	I_{CC}		 410 420	 500	µA
Stromaufnahme, E_V = 1000lx Current consumption, E_V = 1000lx V_{CC} = 2.5 V V_{CC} = 5.0 V	I_{CC}		 460 470	 550	µA
Spektraler Bereich der Fotoempfindlichkeit Spectral range of sensitivity	$\lambda_{10\%}$		475 ... 650		nm
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. photosensitivity	$\lambda_{s\ max}$	540	555	570	nm
Abmessung der bestrahlungsempfindlichen Fläche Dimensions of radiant sensitive area	$L \times B$ $L \times W$		0.4 x 0.4		mm x mm
Ausgangskapazität Output capacitance	C_{OUT}		3		pF
Transferfunktion Transfer function, s. Fig. 1	G	9.5	10	10.5	µA / dek µA / dec
Abweichung der Ausgangskennlinie von der Logarithmierfunktion Deviation of outputcharacteristic from logarithmic function, s. Fig. 1	L	- 3		+ 3	%
Maximale Ausgangsspannung Maximum output voltage	V_{OUT}			V_{CC} - 0.5	V
Einschaltzeit, E_V = 1000 lx Power on time, E_V = 1000 lx V_{CC} = 0V -> V_{CC}	t_{ON}		 0.1	 1.2	ms
Antwortzeit, R_L = 25 kOhm, C = 1 nF Response time, s. Fig. 2 E_V = 100 -> 1000 lx E_V = 1000 -> 100 lx	t_r / t_f		 0.03 0.1		ms

Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value			Einheit Unit
		min.	typ.	max.	
Ausgangsgenauigkeit über Temperaturbereich[1)] Output accuracy over temperature range[1)] E_V = 1000 lx T_A = – 40 °C ... + 100 °C T_A = – 30 °C ... + 70 °C T_A = 0 °C ... + 50 °C	ΔI_{OUT}	 – 2.0 – 1.5 – 0.7	 ± 1.0 ± 0.6 ± 0.2	 + 2.0 + 1.5 + 0.7	µA
Ausgangsdunkelstrom, E_V = 0 Output dark current	I_{out}		0.1	100	nA

[1)] Diese Werte entsprechen einer Photodiode mit einem TC von ungefähr 0.3 %/K.
These values correspond to a photodiode with a TC of approximately 0.3 %/K.

Gruppierung (T_A = 25 °C)
Binning

Bezeichnung Parameter	Symbol Symbol	Wert Value				Einheit Unit
		-1	-2	-3	-4	
Ausgangsstrom[1)] Output current E_V = 1000lx (white LED LW 541C)	I_{out}	25 ... 28	27 ... 30	29 ... 32	31 ... 34	µA

[1)] 3µA Gruppenbreite entspricht einem Verhältnis von 1:2 in der Bestrahlungsstärke.
3µA bin width is equivalent to a spread of 1:2 of the irradiance.

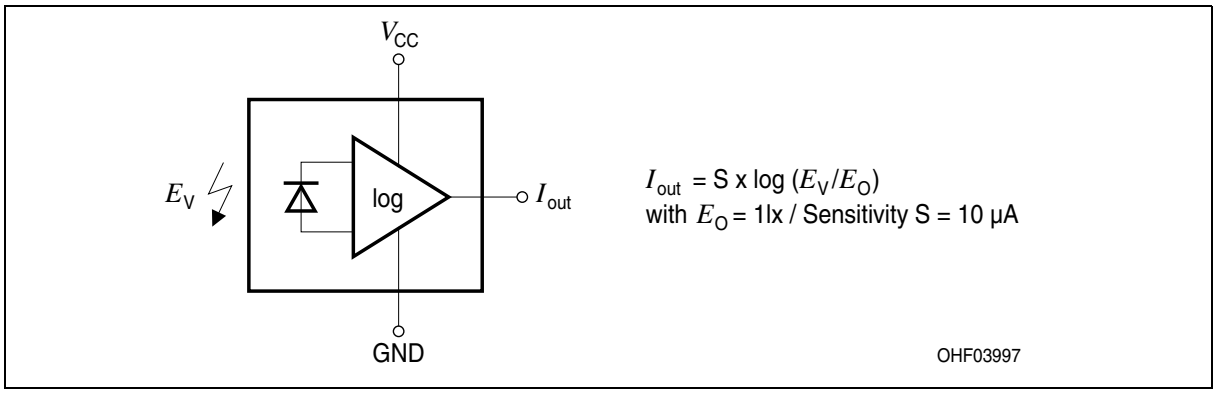


Figure 1 **Ersatzschaltbild**
Equivalent Circuit

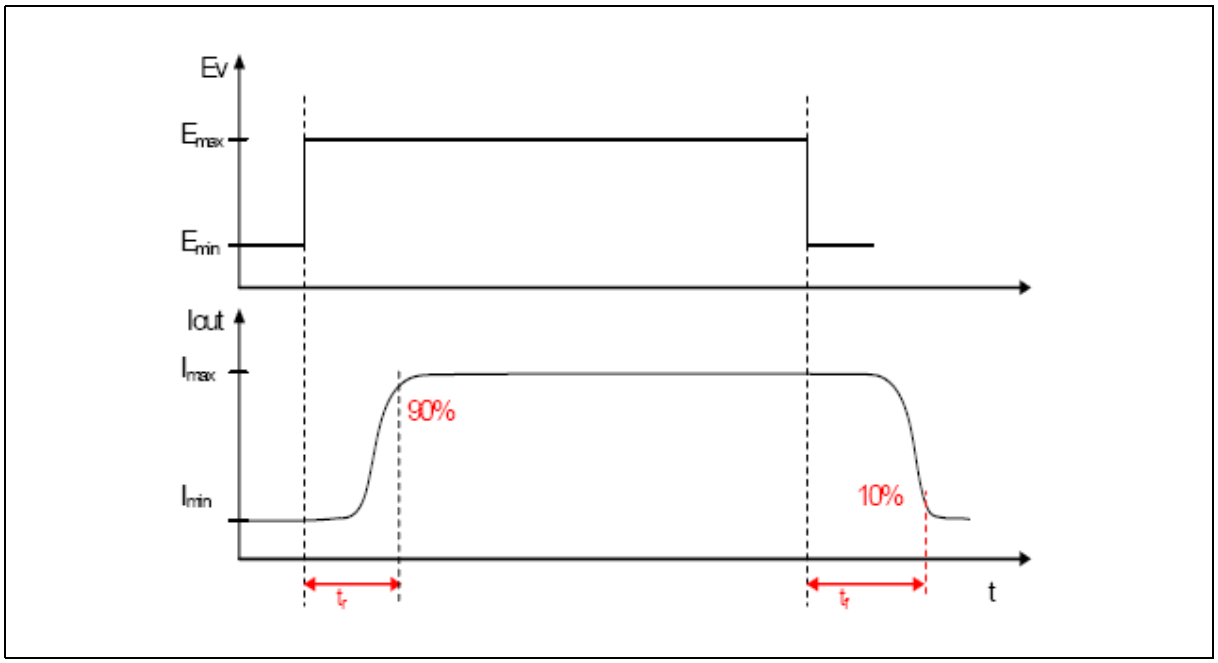
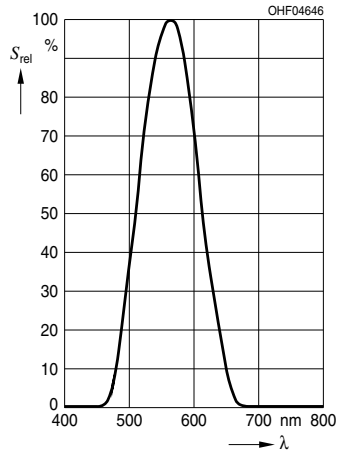


Figure 2 **Definition der Antwortzeit**
Definition of Response Time

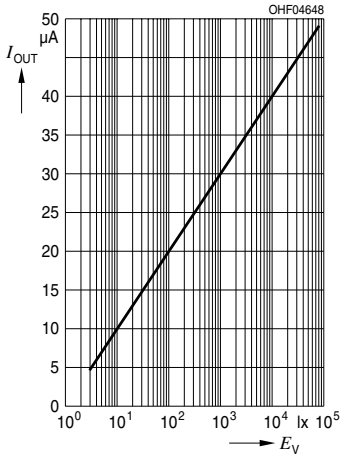
Relative Spectral Sensitivity of photodiode

$S_{rel} = f(\lambda)$



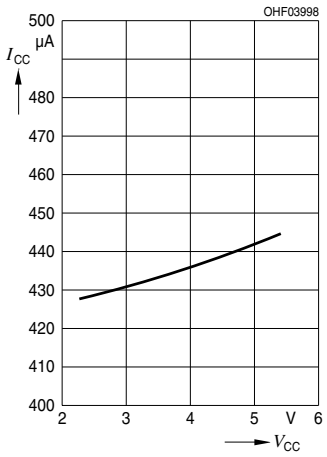
Output Current

$I_{OUT} = f(E_v)$



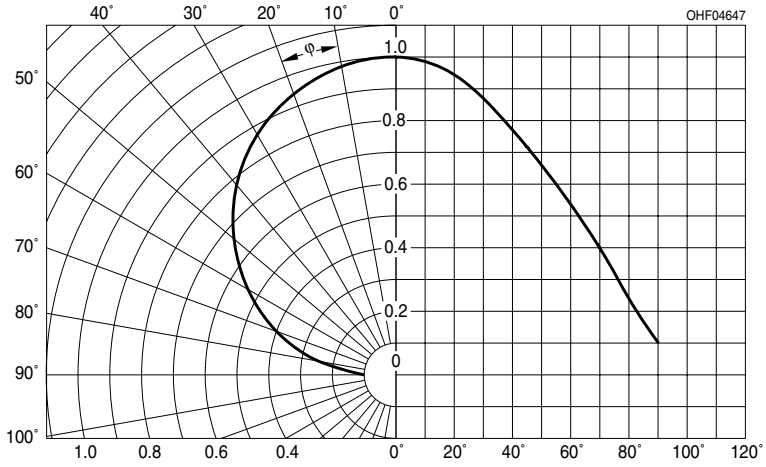
Current Consumption

$I_{cc} = f(V_{cc})$

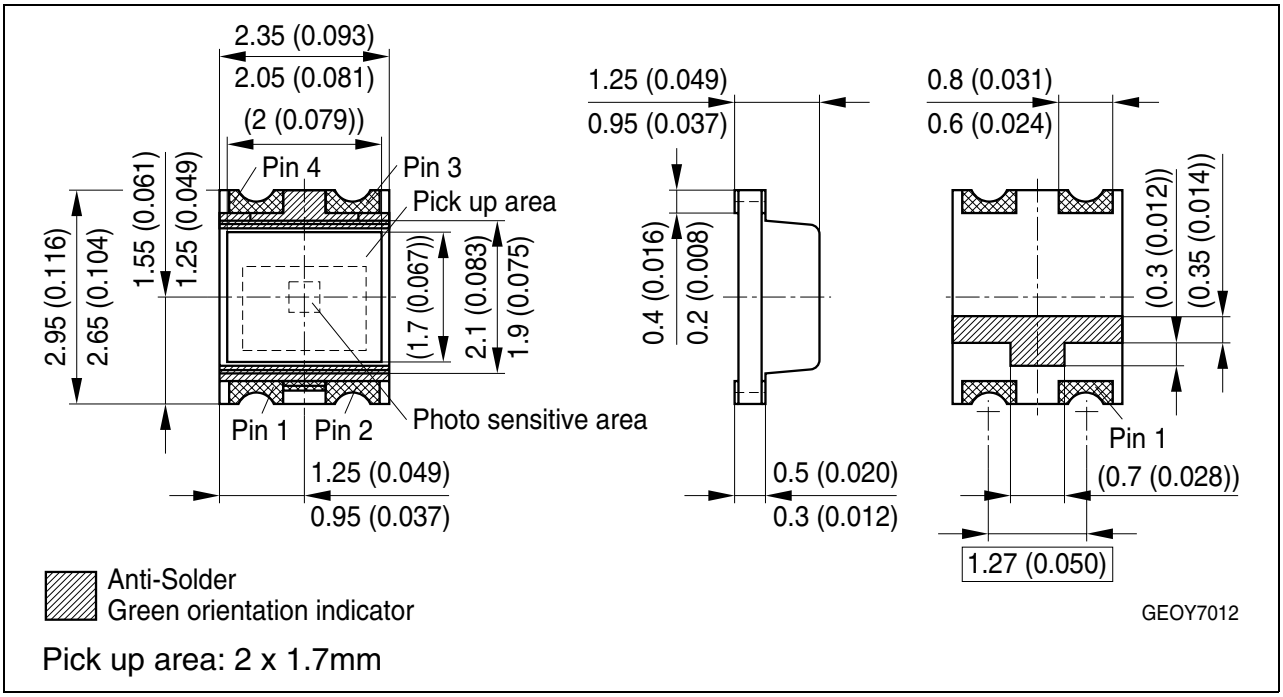


Directional Characteristics

$S_{rel} = f(\varphi)$



Maßzeichnung
Package Outlines

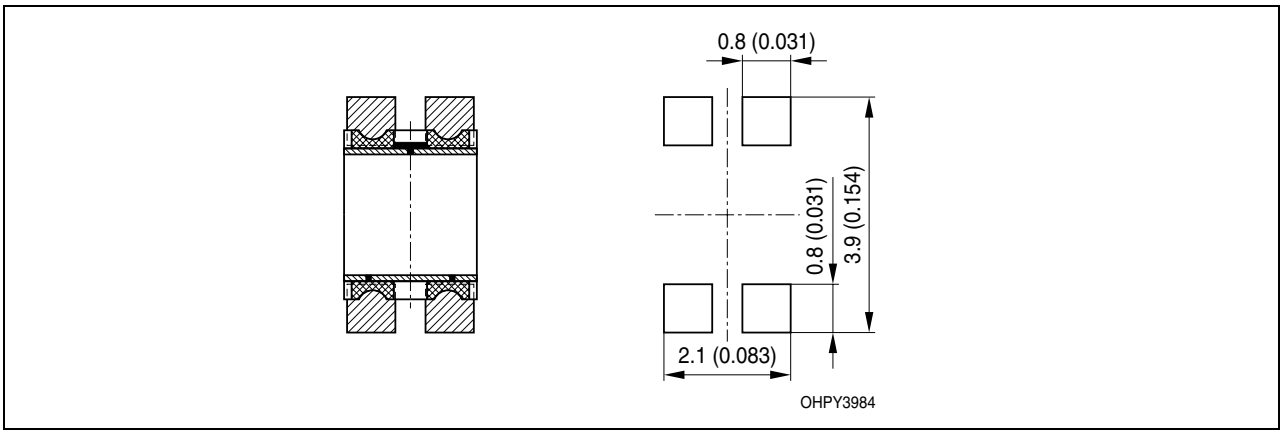


Maße in mm (inch) / Dimensions in mm (inch)

Anschlußbelegung
Pin configuration

Pin #	Description
1	GND
2	GND
3	V_{CC}
4	I_{OUT}

Empfohlenes Lötpaddesign
Recommended Solderpad Design



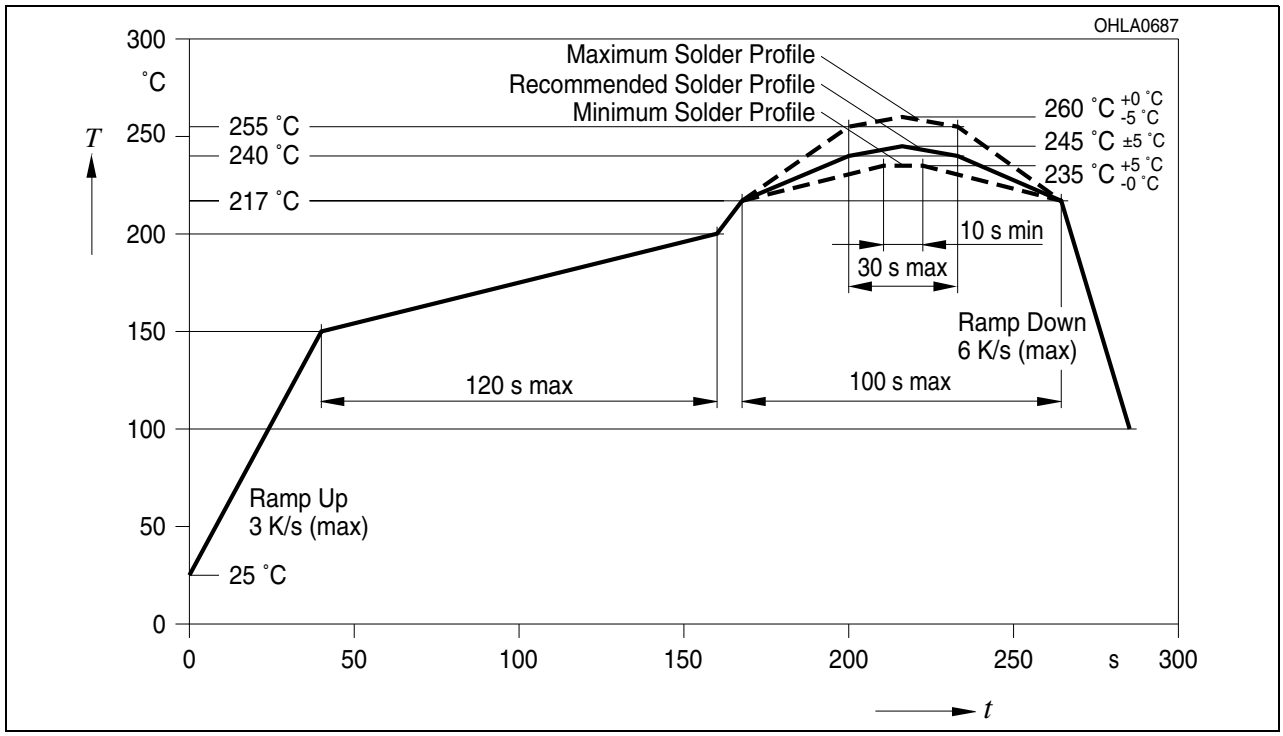
Maße in mm (inch) / Dimensions in mm (inch)

Lötbedingungen
Soldering Conditions

Vorbehandlung nach JEDEC Level 3/4
Preconditioning acc. to JEDEC Level 3/4

Reflow Lötprofil für bleifreies Löten
Reflow Soldering Profile for lead free soldering

(nach J-STD-020C)
(acc. to J-STD-020C)



EU RoHS and China RoHS compliant product

此产品符合欧盟 RoHS 指令的要求；

按照中国的相关法规和标准，不含有毒有害物质或元素。

Published by
OSRAM Opto Semiconductors GmbH
Leibnizstraße 4, D-93055 Regensburg
www.osram-os.com

The information describes the type of component and shall not be considered as assured characteristics.
Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose! Critical components [1] , may only be used in life-support devices or systems [2] with the express written approval of OSRAM OS.

[1] A critical component is a component usedin a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

[2] Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.