PCN

AO-PCN-2022-034-A

New chip introduction for SFH 3410/R

Published by ams-OSRAM AG
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01.07.2022

Dear Customer,

please review this **PCN** and provide your feedback in the **Customer approval form** (at the end of this PCN document) to your ams OSRAM sales partner before **08.08.2022** *).

Your prompt reply will help ams OSRAM to assure a smooth and well executed transition. If ams OSRAM does not hear from your side by the due date, we will assume your (if you are a Distributor: and your customer's) full acceptance to this proposed change and its implementation.

ams OSRAM understands the time requirements your organization needs to approve this PCN.
However, if you can provide ams OSRAM an estimated date your organization will have finalized this PCN review, ams OSRAM can use this date to plan continued production to secure your order needs during the transition time.

Your attention and response to this matter is highly appreciated.

Please direct your inquiries to your local Sales office.

*) ams OSRAM aligns with the widely recognized JEDEC/ECIA/IPC Joint Standard No. 46, which stipulates:

- Customers should acknowledge receipt of the PCN within 30 days of delivery of the PCN.
- Lack of acknowledgement of the PCN within 30 days constitutes acceptance of the change.
- After acknowledgement, lack of additional response within the 90 day period constitutes acceptance of the change. If the customer requires additional time to perform sample testing, beyond the 90 day review period, an extension must be negotiated with the supplier.

Subject of change:	New chip introduction for SFH 3410/R	
Affected products:	SFH 3410; SFH 3410R	
Reason for change:	To secure continuous supply as Supplier A will discontinue the chip supply.	
Description of change:	Current status	New status
	Chip from Supplier A in Austria	Chip from Supplier B in Taiwan
	For details refer to document 2_cip_AO-PCN-2022-034-A	
Product identification:	Date code	
Time schedule for PCN material: (after implementation of change):	Final qualification report:	available
	Samples available:	On request
	Intended Start of delivery:	15.08.2022 *) *) or earlier if released by customer and upon mutual agreement
Time schedule for Pre-PCN material: (prior to implementation of change):	Last time order date (LTO):	01.09.2022 **) **) Lead time and LTO quantity shall be mutually agreed between OSRAM OS and customer.
	Last time delivery date (LTD):	01.12.2022 ***) ***) planned last date for delivery of products of current status
Assessment:	The new chip was characterized and datasheet change is required. The datasheets are updated accordingly. For details please refer to 2_cip_AO-PCN-2022-034-A.	
Documentation:	Customer information package: 2_cip_AO-PCN-2022-034-A Qualification Report: 3_cip_AO-PCN-2022-034-A_qual Datasheets: 4_cip_AO-PCN-2022-034-A_SFH3410 5_cip_AO-PCN-2022-034-A_SFH3410R	

Note:
Pre-PCN material: Products of current status, means before implementation of the changes as described in the PCN.
PCN material: Products with implementation of the changes as described in the PCN.

Customer approval form
AO-PCN-2022-034-A

New chip introduction for SFH 3410/R

Please list product(s) affected in your application(s):

Please check the appropriate box below:

○ **Approval:** We agree with the proposed change and accept start of the shipment upon availability of PCN material	○ **Not relevant:** Change is not relevant for products in use.

○ **Change cannot be accepted:**

- ○ **We have objections:**
- ○ **We request following Information:**
- ○ **We request following Samples:**
- ○ **Expected approval date:**
- ○ **Volume requirements for Pre-PCN material:**

○ **Remarks:**

Sender:

Company:

Address / Location:

Signature: **Date:**

Please return this approval form to your Sales partner.

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PCN AO-PCN-2022-034-A
New chip introduction for SFH 3410/R

Customer information package

D.Czyborra, OS Q CQM ICI
2022-07-01

Agenda

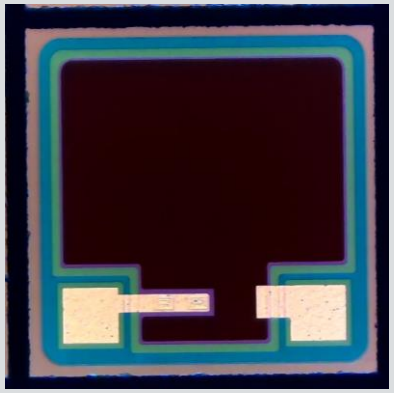
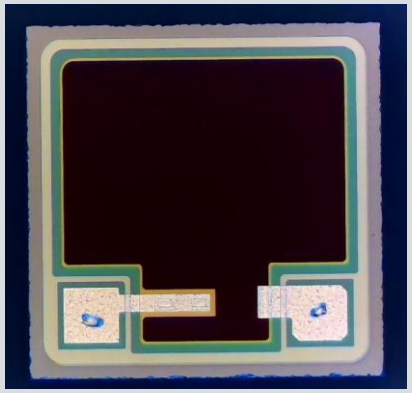
AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Reason for change

Item	Description
Chip	To secure continuous supply as Supplier A will discontinue the chip supply.

AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Description of change

Item	Current status	New status
Chip	Chip Supplier A	Chip Supplier B
Chip size	750µm x 750µm x 185µm	750µm x 750µm x 185µm
Picture		

AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Changes in datasheet due to chip change.

Item	Current status	New status
Capacitance V_{CE} = 0 V; f = 1 MHz; E = 0	typ. 3.9 pF	typ. 3.4 pF
Spectral range of sensitivity $\lambda_{10\%}$	350…970 nm	400…950 nm
Dark current V_{CE} = 5 V	3nA – 50nA	6nA – 50nA

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New Chip introduction for SFH 3410/R

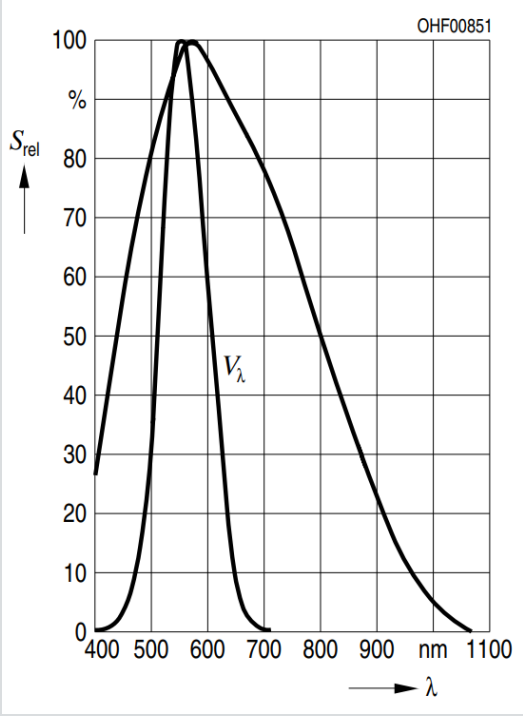
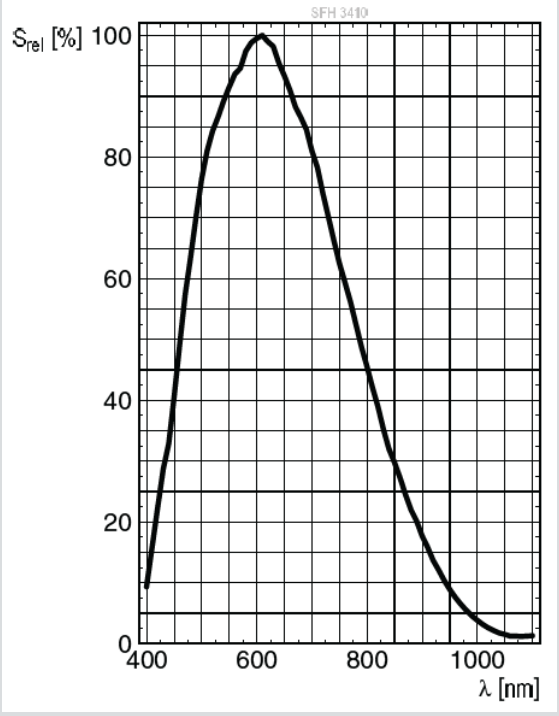
Correction in datasheet not related to chip change

Item	Current status	New status
Dark current	V_{CE} = 5 V	V_{CE} = 5 V; E = 0
Collector-emitter saturation voltage	$I_C = I_{PCE,min}$ X 0.3; E_e = 0 mW/cm²; E_v = 20 lx; 0	$I_C = I_{PCE,min}$ X 0.3; E_v = 20 lx; Std. Light A
Wavelength of max sensitivity $\lambda_{S\ max}$	570 nm	600 nm

Note: After PCN approval and shipment of new material, the new data sheet versions will be valid.
Latest version of data sheet is accessible on the ams OSRAM homepage.

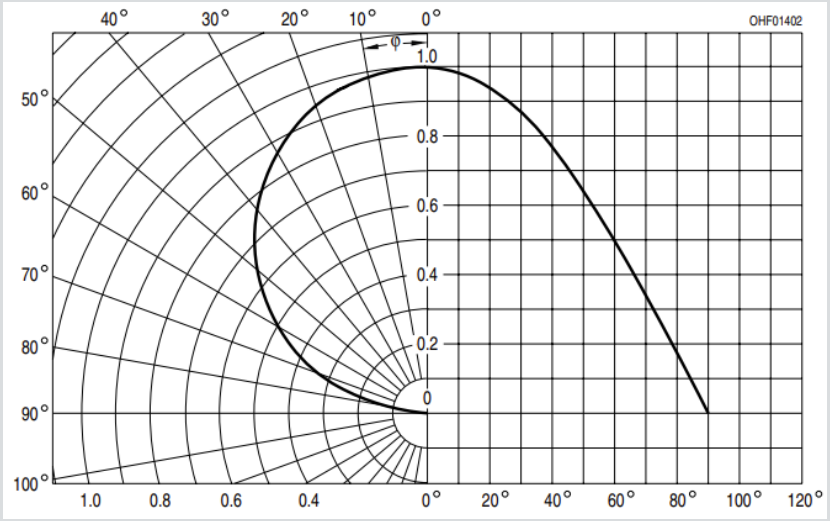
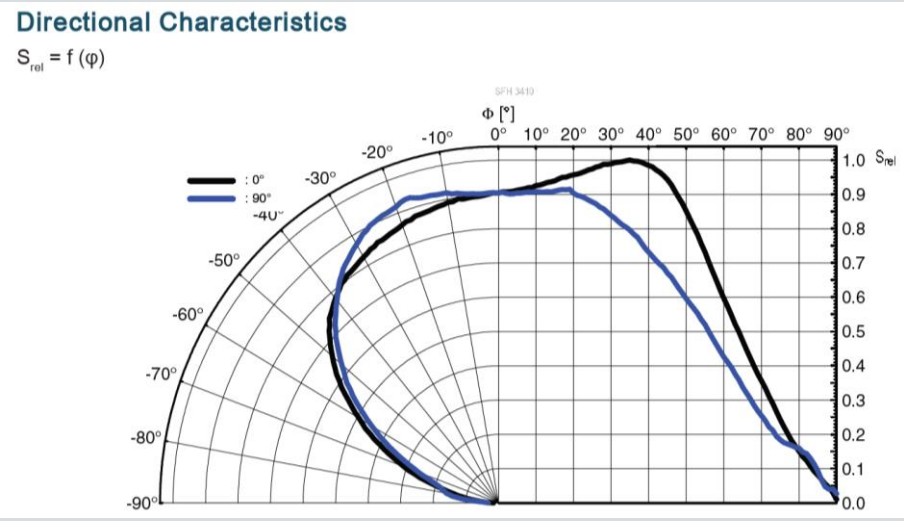
AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Changes in datasheet due to chip change

Item	Current status	New status
Relative Spectral Sensitivity Srel = f (λ)		

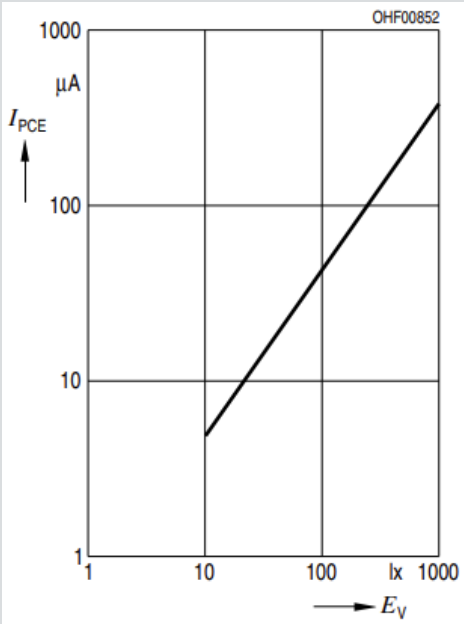
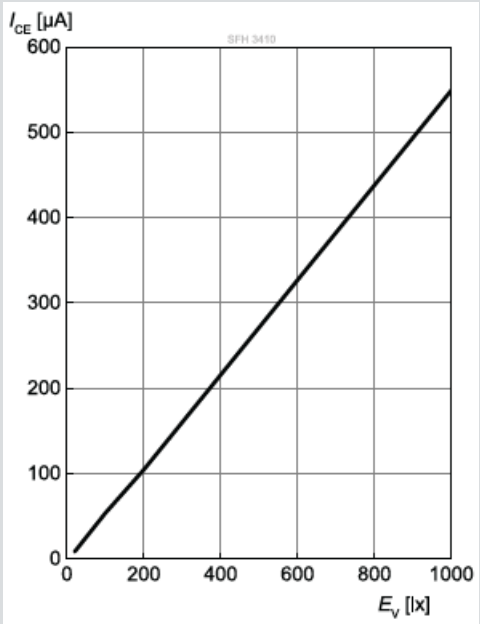
AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Correction in datasheet not related to chip change

Item	Current status	New status
Directional Characteristics $S_{rel} = f(\varphi)$		

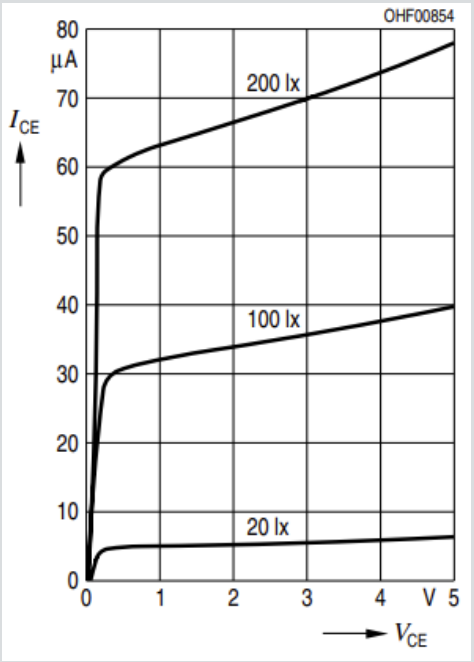
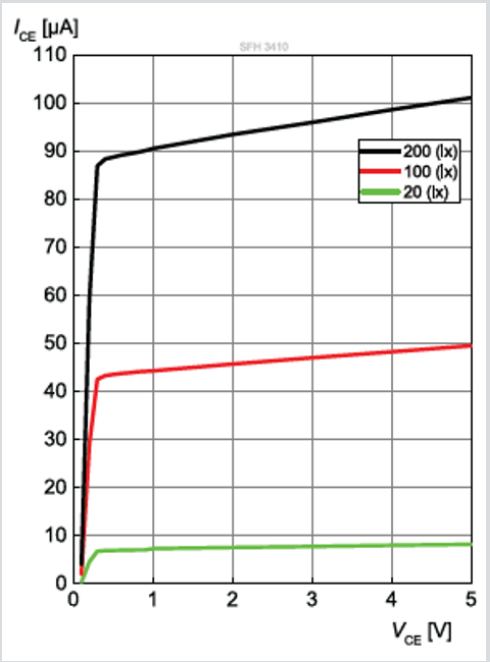
AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Changes in datasheet due to chip change.

Item	Current status	New status
Photocurrent	I_{PCE} = f (Ev); V_{CE} = 5 V; 0 	I_{PCE} = f (Ev); VCE = 5 V; Std. Light A 

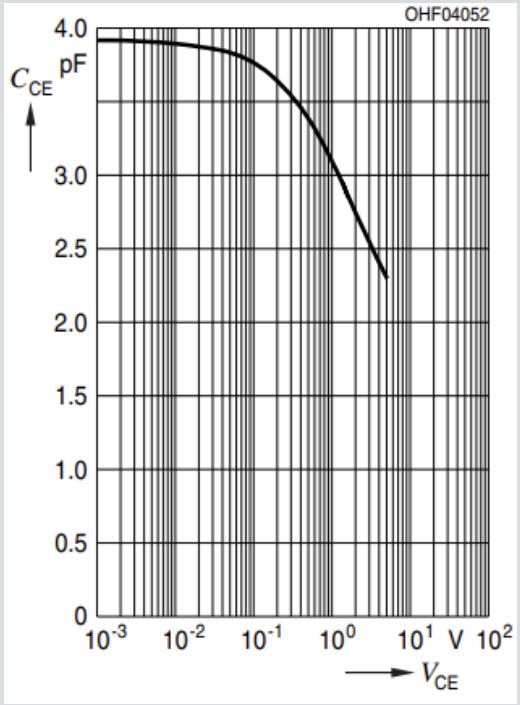
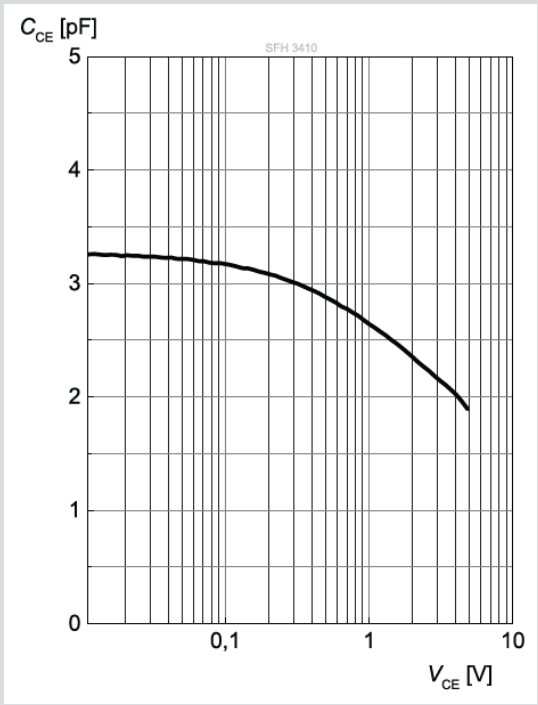
AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Changes in datasheet due to chip change.

Item	Current status	New status
Collector-Emitter Current/ Photocurrent	I_{CE} = f (VCE, Ev); 0 	I_{CE} = f (V_{CE}, E_v); Std. Light A 

AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Changes in datasheet due to chip change.

Item	Current status	New status
Collector-Emitter Capacitance $C_{CE} = f(V_{CE})$; f = 1 MHz; E = 0		

AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

List of affected products

Smart DIL
SFH 3410
SFH 3410 R

AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

PCN Samples

Smart DIL
SFH 3410
SFH 3410 R

Color code: available on request

AO-PCN-2022-034-A
New Chip introduction for SFH 3410/R

Time schedule

for PCN material (after implementation of change):		
Final qualification report	available	
Samples available	On request	
Intended Start of delivery	15.08.2022 *)	*) or earlier if released by customer and upon mutual agreement

for Pre-PCN material (prior to implementation of change):		
Last time order date (LTO)	01.09.2022 **)	**) Lead time and LTO quantity shall be mutually agreed between OSRAM OS and customer.
Last time delivery date (LTD)	01.12.2022 ***)	***) planned last date for delivery of products of current status

Note:
Pre-PCN material: Products of current status, means before implementation of the changes as described in the PCN.
PCN material: Products with implementation of the changes as described in the PCN.

Sensing is life

Light is OSRAM

OSRAM
Opto Semiconductors

Reliability Report 210228C2

Subject	Qualification report for Smart DIL product family
Date	10.02.2022
Tested device	SFH 3410
Brand (including sub brands)	Smart DIL
Applies to	SFH 3410; SFH 3410R

Pre-conditioning according to Jedec Level 4

Test Performed	Condition	Duration	Sample Size	Failures El.	Failures Opt.	Failures Vis.
High Humidity High Temperature Reverse Bias H³TRB *JESD22-A101*	T_A = 85°C, r.H.= 85%; Vr = 4.4V	1000h	4x26	0	0	0
Temperature Cycling TC *JESD22-A104*	T_A = -40°C/+100°C 15min each extreme	1000c	4x26	0	0	0
High temperature & reverse bias HTRB *JESD22-A108*	T_A = 100°C, Vr = 4.4V	1000h	4x26	0	0	0
Resistance to Solder Heat RSH *JESD22-A113*	Reflow soldering 260°C	3x	4x26	0	0	0
Electrostatic Discharge HBM *ANSI/ESDA/ JEDEC JS-001*	Human Body Model	2000V	4x10	0	0	0
Electrostatic Discharge CDM *AEC-Q101-005*	Charged Device Model	750V	4x10	0	0	0

Note: Lot A: Chip source A; Lots B – D: Chip source B

Failure criteria:

Electrical failures:	I_{CE0} (Vce = -5V)	> 50nA
Optical failures:	I_{PCE} (Vce = -5V; Std. Light A; E_v = 20 lx)	> initial value: ±25% max.
Visual failures:	broken or damaged package or leads	

Conclusion: The tested devices fulfill the reliability requirements.

Disclaimer

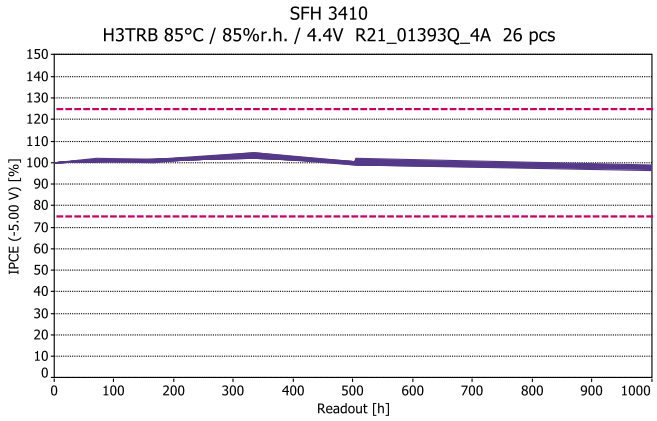
PLEASE CAREFULLY READ THE BELOW TERMS AND CONDITIONS BEFORE USING THE INFORMATION.
IF YOU DO NOT AGREE WITH ANY OF THESE TERMS AND CONDITIONS, DO NOT USE THE INFORMATION.

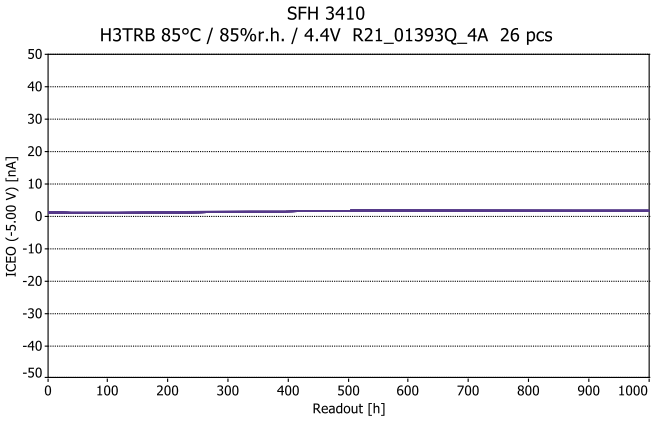
The Information contained in this Document does not constitute an independent warranty. The committed behavior is described in the Product data sheet and/or further, mutually agreed specifications.
Distribution of part or all of the contents of this Document to any 3rd party in any form without the prior permission of OSRAM Opto Semiconductors GmbH is prohibited except in accordance with applicable mandatory law.

Further explanations:
Data: The Data used in this Document consider the reliability test results under the mentioned driving conditions only. For Product information on the maximum operating conditions and the OSRAM OS standard qualification profile please refer to the Product data sheet or contact your local sales partner.
Conditions: The conditions for the generation of the Data are as follows:
1. The Data and curves shown in this Document are based on experiments carried out under laboratory conditions on a random sample size of LED/IRED/Laser/Detector with readouts at discrete readout times (where applicable). Thus, the Data above represent a limited number of production lots only and may differ between different assembly lots over time (including chip or package changes). Thus, the behavior of the LED/IRED/Laser/Detector in the final application may differ from the Data. The behavior of the LED/IRED/Laser/Detector at conditions or readout times deviating from those stated above may not be deduced from the Data.
2. If applicable:
    a) Extended driving conditions:
    The tested driving conditions exceed the maximum limits stated in the Product data sheet. Therefore a reduced lifetime or an accelerated degradation is expected. Failure limits noted in the Document refer to the testing condition according to the OSRAM OS standard Product qualification profile and not to the actual testing condition.
    b) Extended testing duration:
    The testing duration exceed the OSRAM OS standard qualification profile of the mentioned Product. Failure limits noted in the Document refer to the testing duration according to the OSRAM OS standard Product qualification profile and not to the actual testing duration.
    c) Exceeding standard qualification conditions – (Product data sheet limits not affected):
    The tested driving conditions exceed the OSRAM OS standard qualification profile of the mentioned Product. Therefore a reduced lifetime or an accelerated degradation is expected. Failure limits noted in the Document refer to the testing condition according to the OSRAM OS standard Product qualification profile and not to the actual testing condition.
3. For long term operation additional failure modes of the chip or package can occur which are not shown in this Document.
4. Possible differences in the thermal management of OSRAM OS and customer’s setup may lead to a different aging behavior.

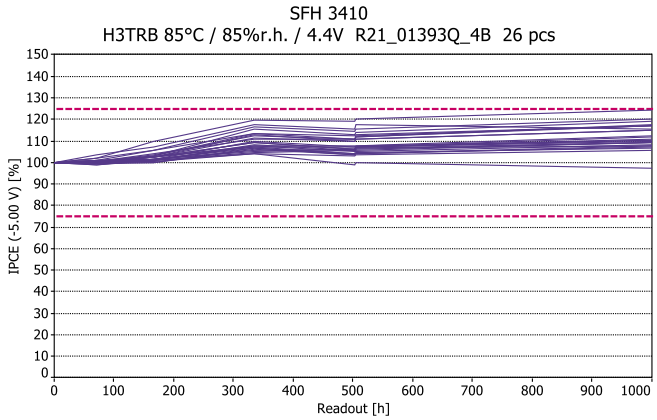
H³TRB 85°C/85%r.H.; Vr=4.4V

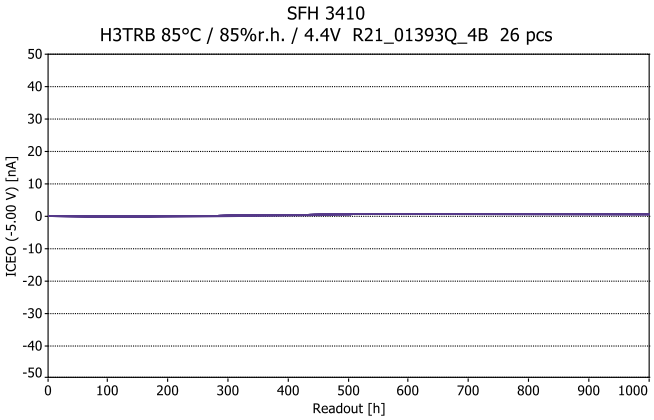
Lot A



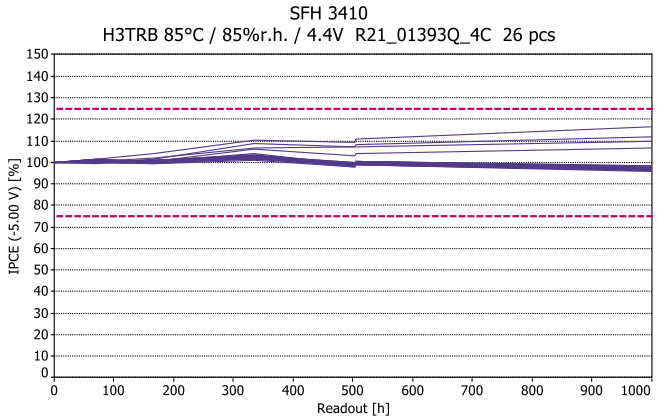


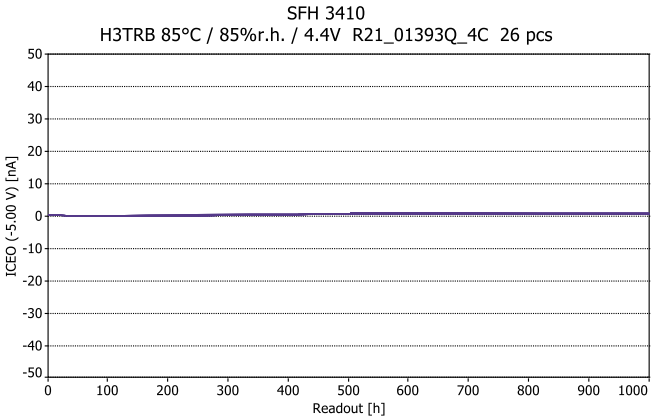
Lot B



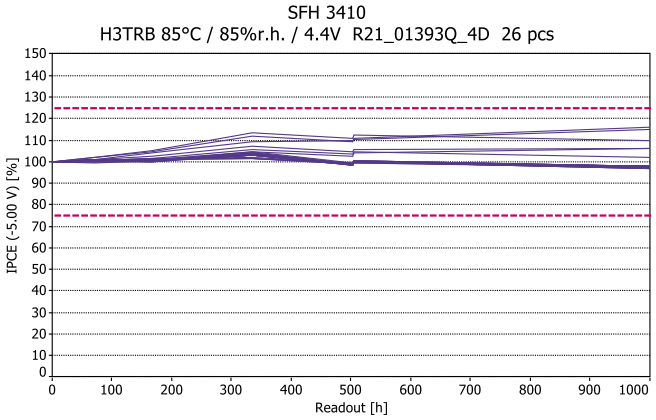


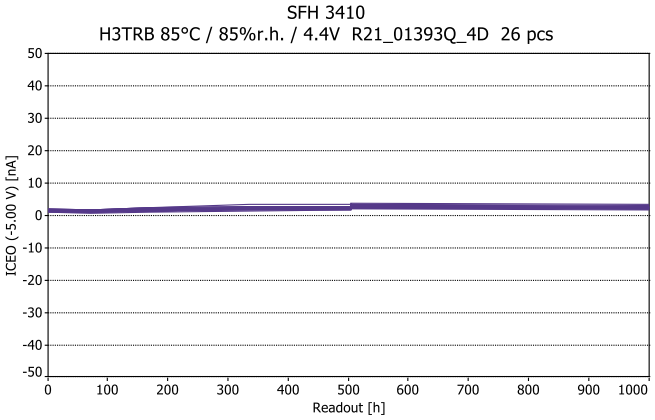
Lot C





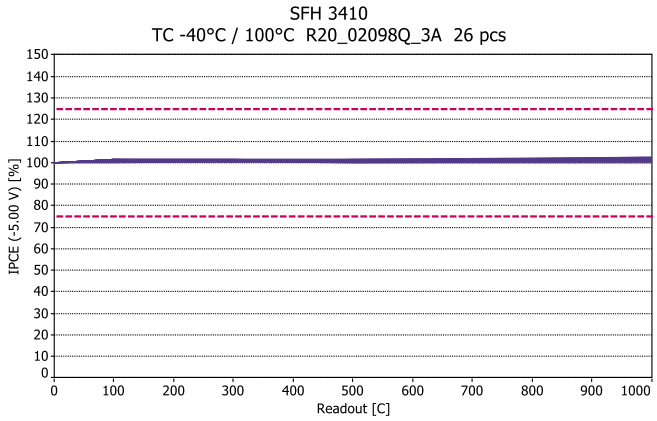
Lot D

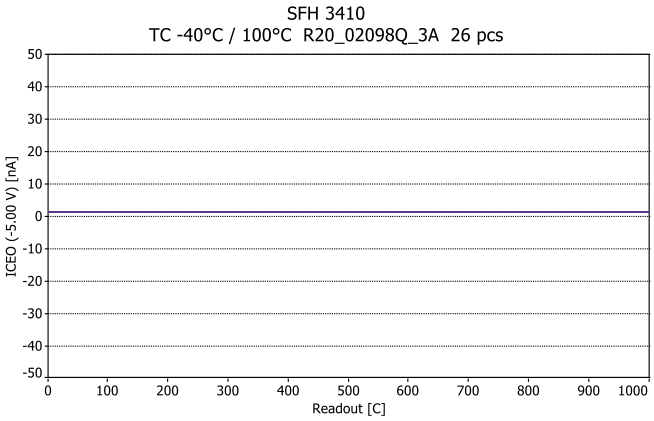

SFH 3410
H3TRB 85°C / 85%r.h. / 4.4V R21_01393Q_4D 26 pcs
IPCE (-5.00 V) [%]
Readout [h]


SFH 3410
H3TRB 85°C / 85%r.h. / 4.4V R21_01393Q_4D 26 pcs
ICEO (-5.00 V) [nA]
Readout [h]

TC -40°C/100°C

Lot A





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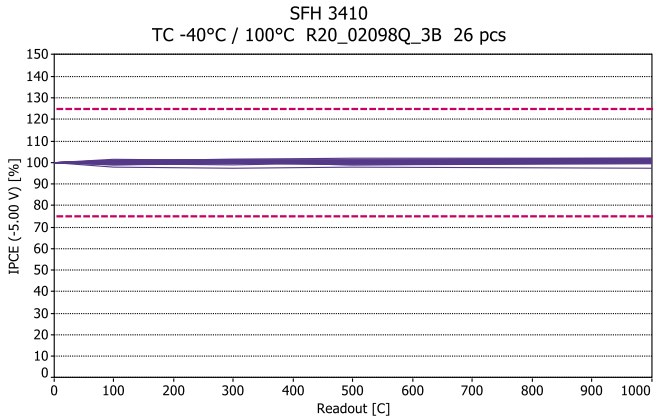
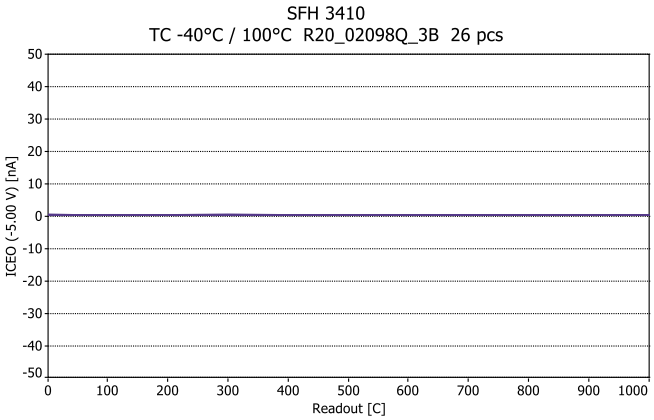
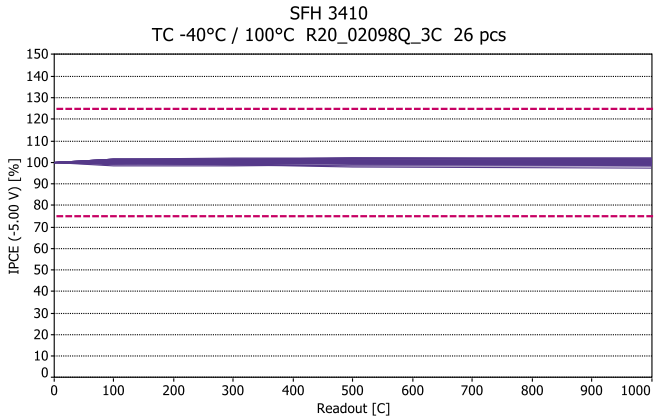
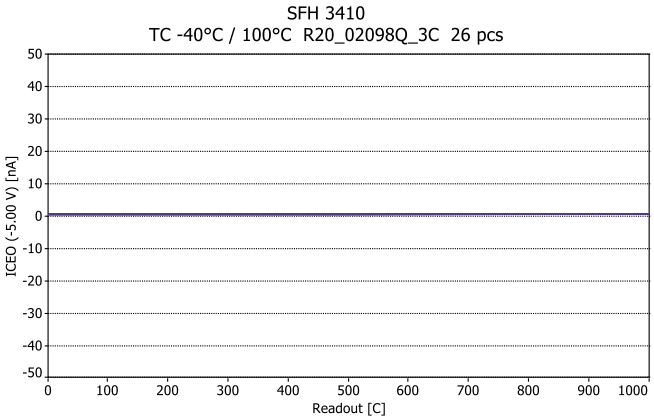


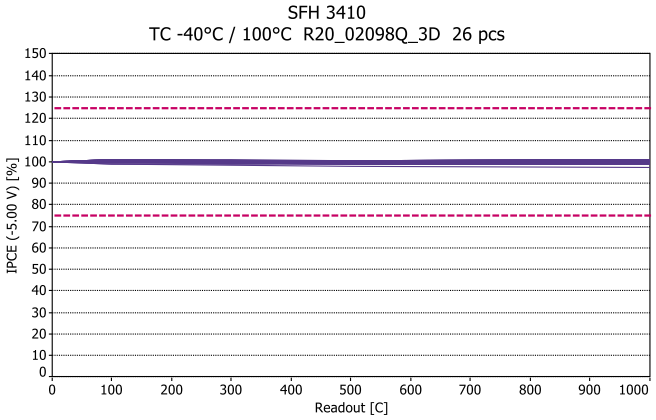


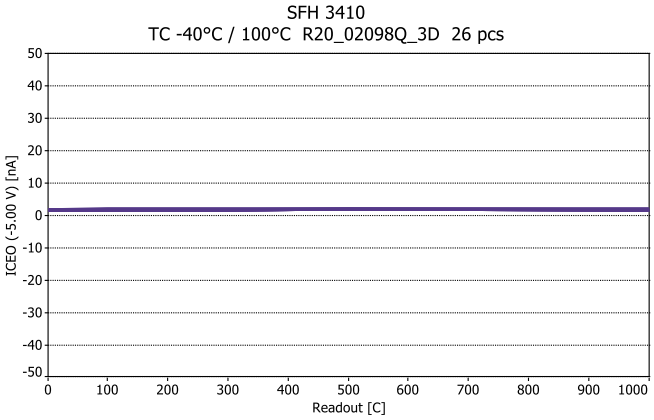
Lot C





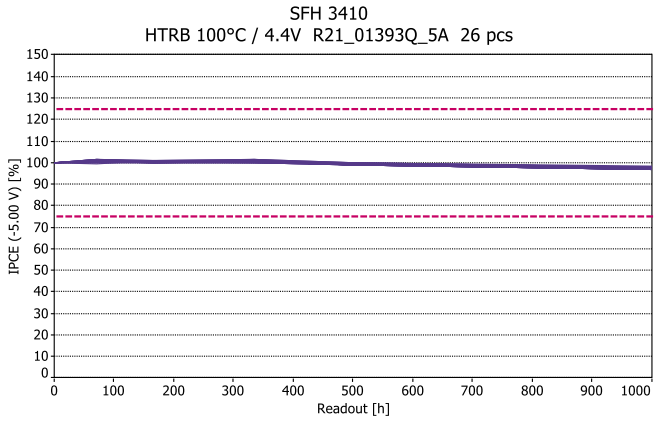
Lot D

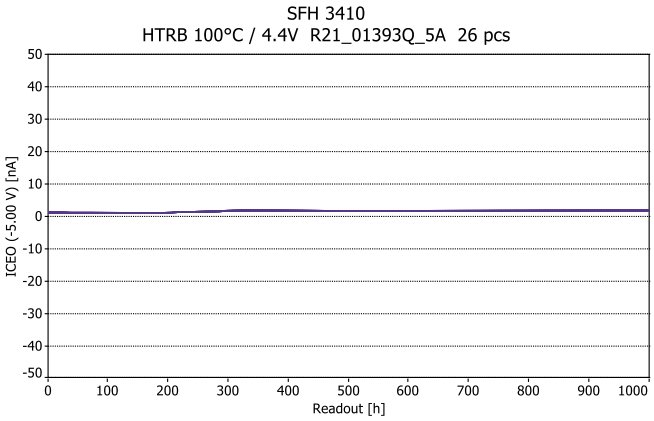

SFH 3410
TC -40°C / 100°C R20_02098Q_3D 26 pcs
IPCE (-5.00 V) [%]
Readout [C]


SFH 3410
TC -40°C / 100°C R20_02098Q_3D 26 pcs
ICEO (-5.00 V) [nA]
Readout [C]

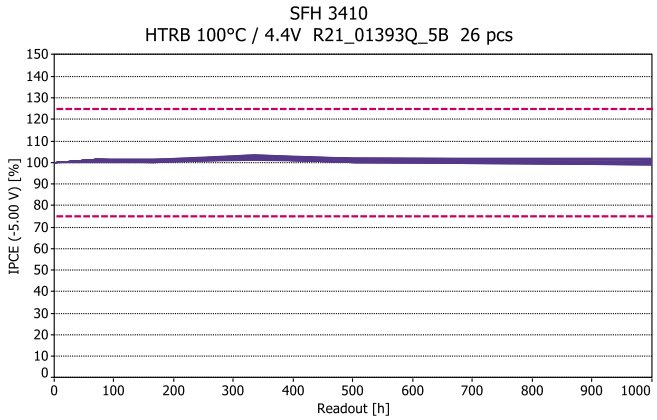
HTRB 100°C/Vr=4.4V

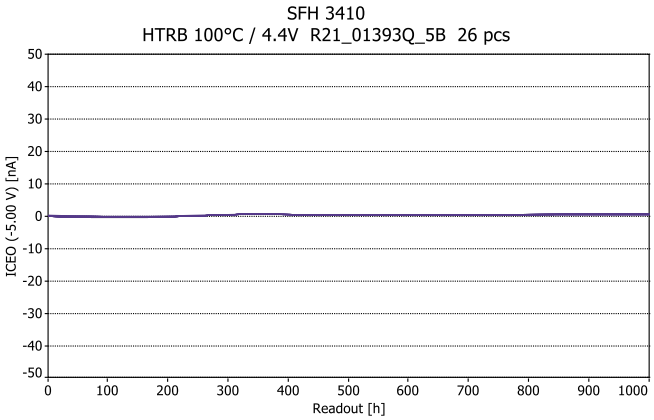
Lot A



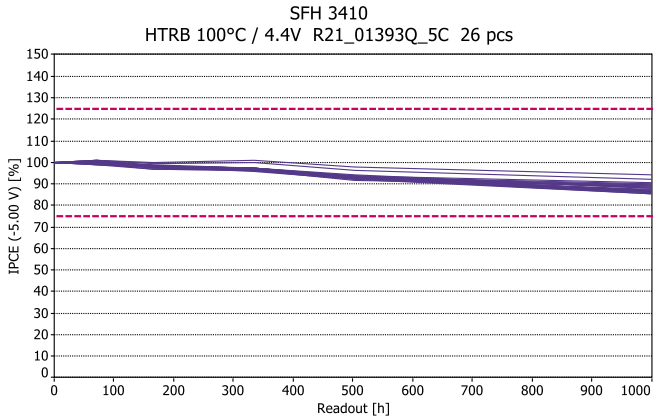


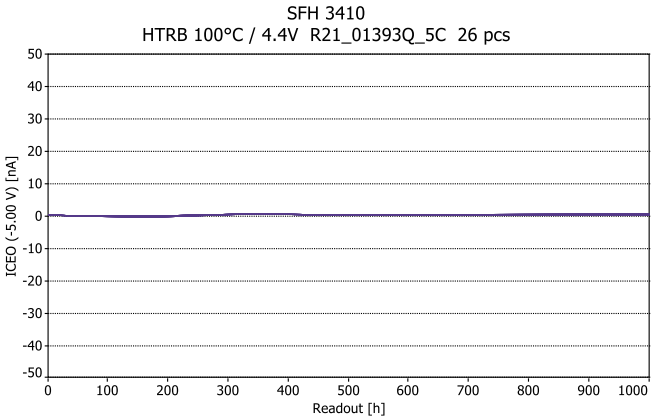
Lot B



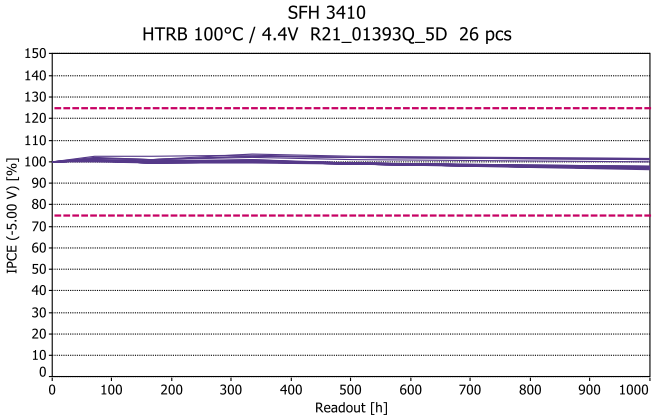


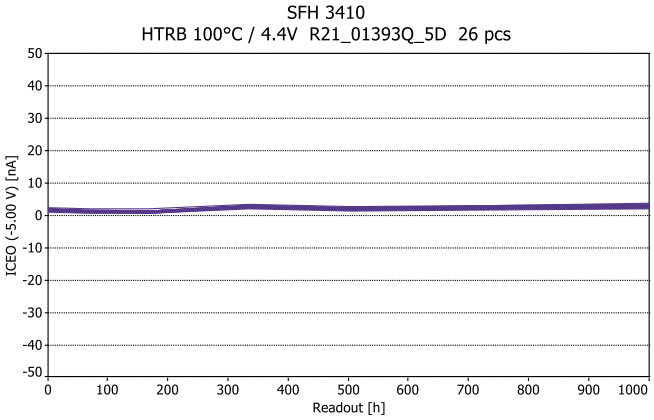
Lot C





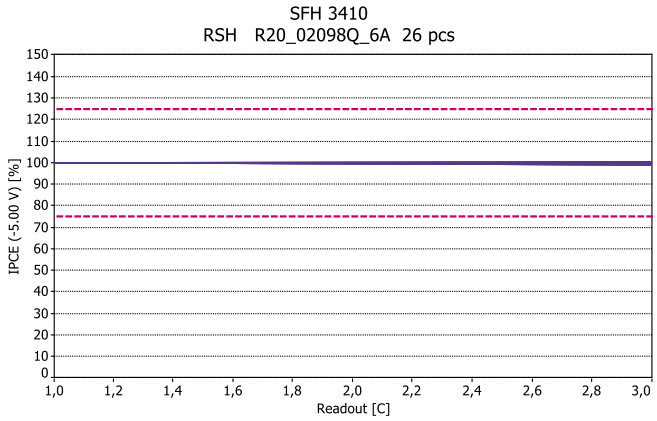
Lot D

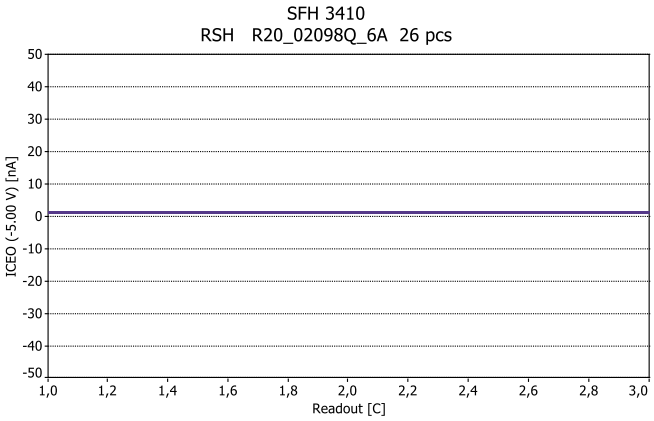

SFH 3410
HTRB 100°C / 4.4V R21_01393Q_5D 26 pcs
IPCE (-5.00 V) [%]
Readout [h]


SFH 3410
HTRB 100°C / 4.4V R21_01393Q_5D 26 pcs
ICEO (-5.00 V) [nA]
Readout [h]

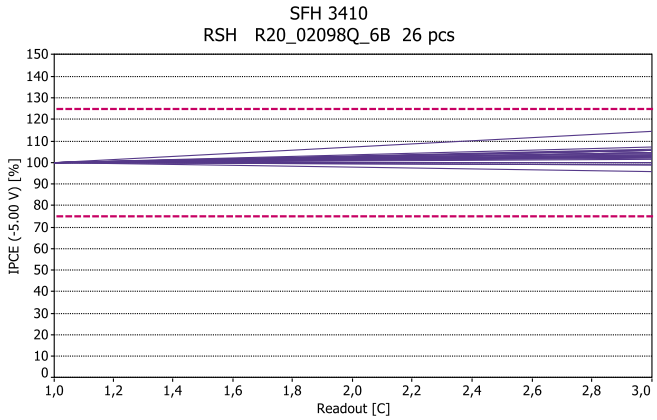
RSH Resistance to Solder Heat

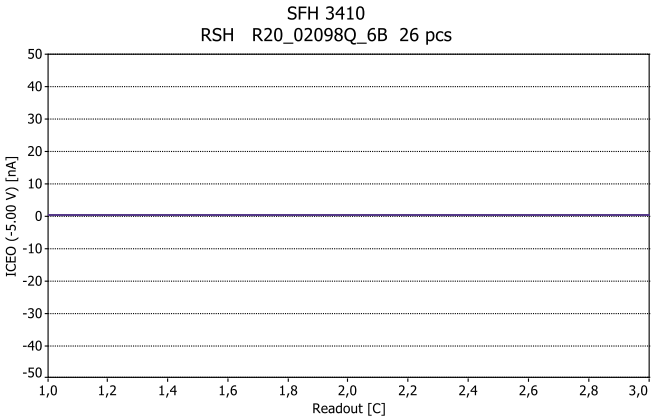
Lot A



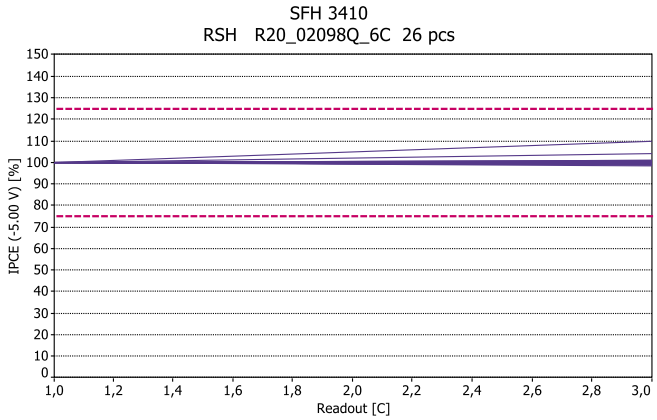


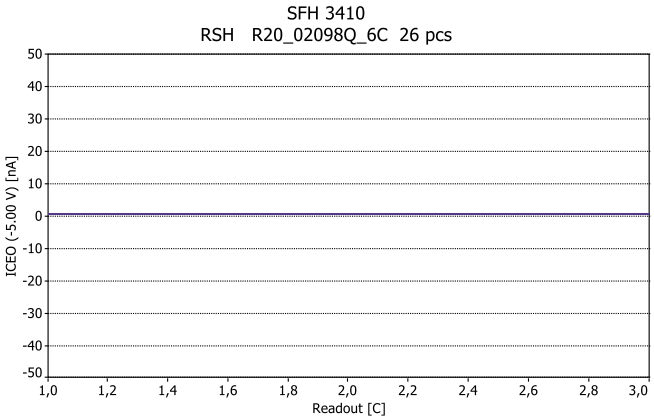
Lot B



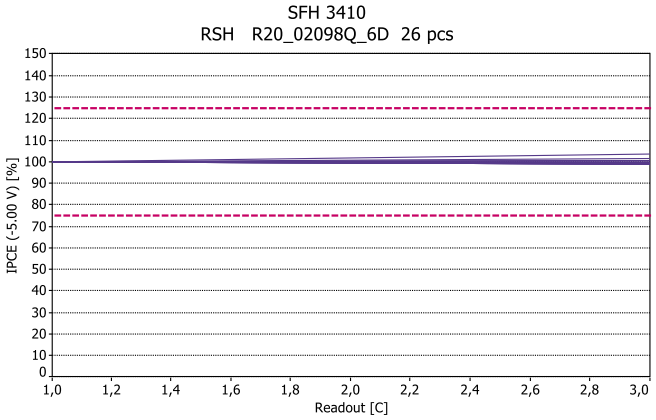


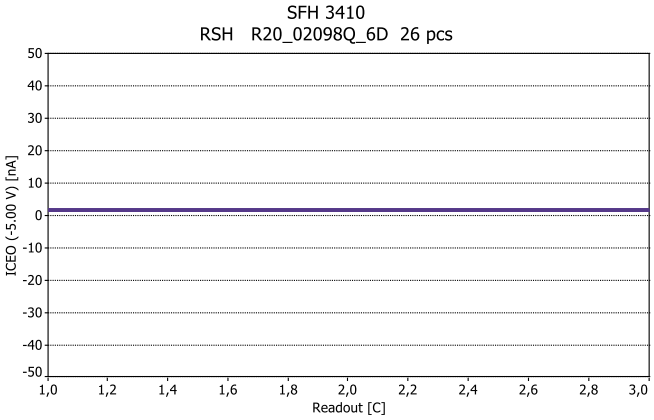
Lot C





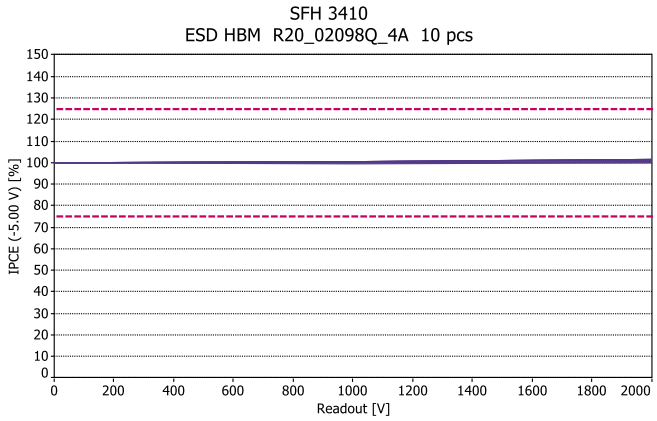
Lot D

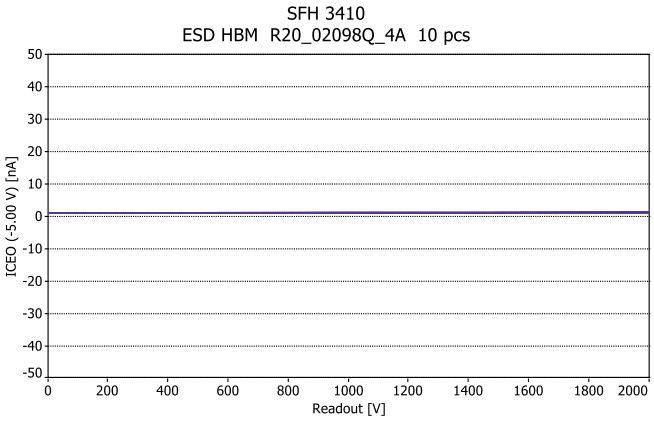

SFH 3410
RSH R20_02098Q_6D 26 pcs
IPCE (-5.00 V) [%]
Readout [C]


SFH 3410
RSH R20_02098Q_6D 26 pcs
ICEO (-5.00 V) [nA]
Readout [C]

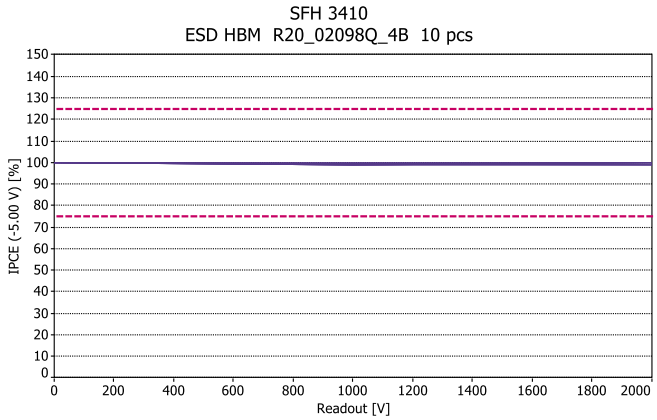
ESD HBM Human Body Model

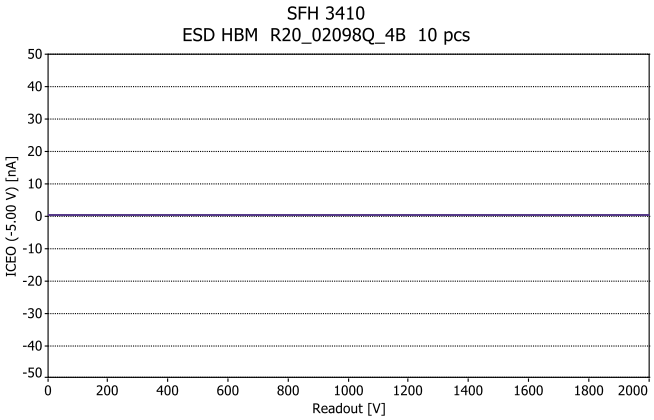
Lot A



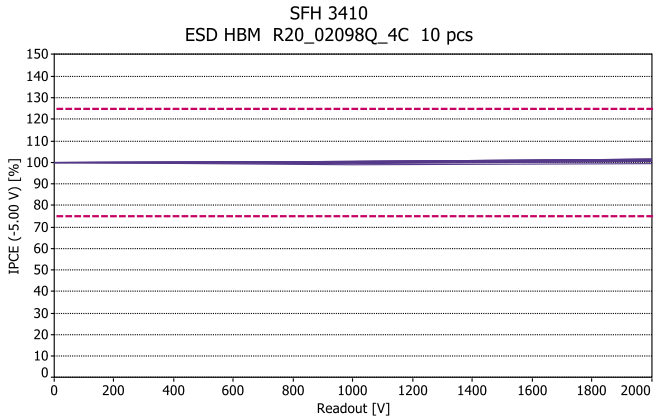


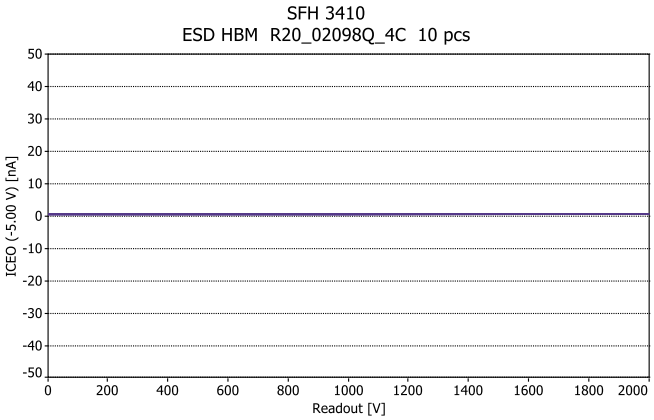
Lot B



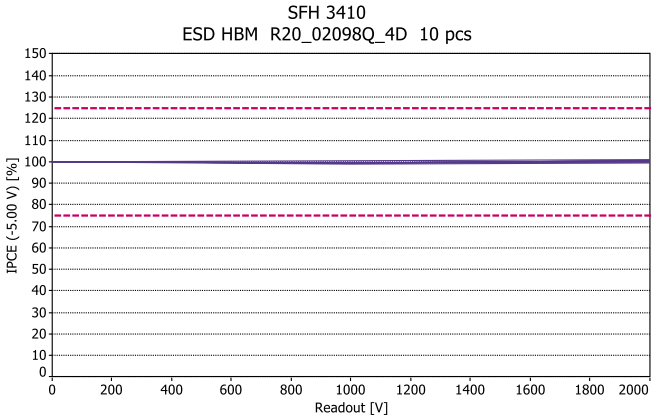


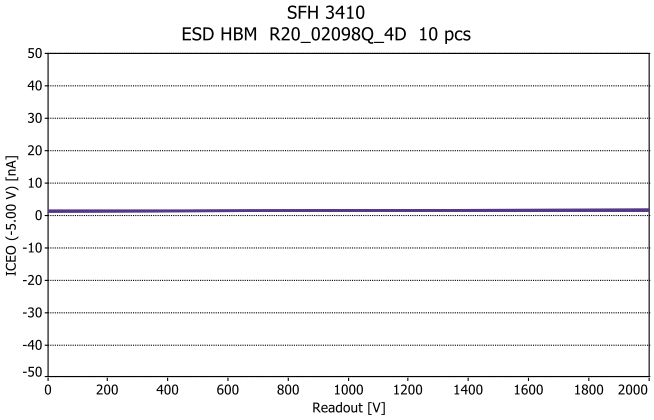
Lot C





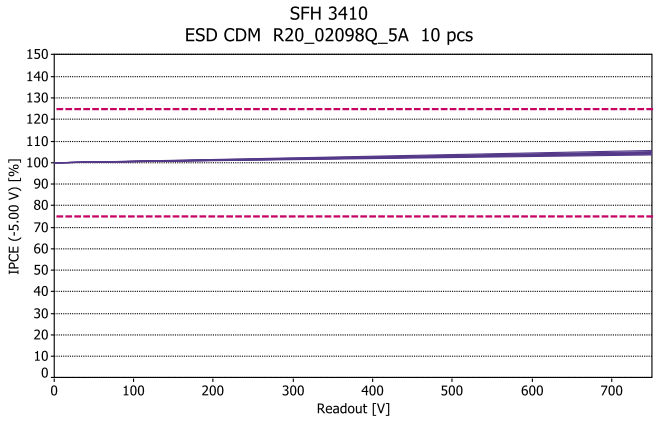
Lot D

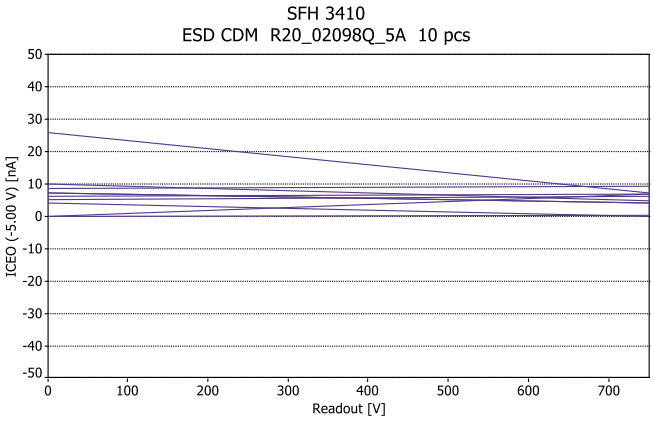

SFH 3410
ESD HBM R20_02098Q_4D 10 pcs
IPCE (-5.00 V) [%]
Readout [V]


SFH 3410
ESD HBM R20_02098Q_4D 10 pcs
ICEO (-5.00 V) [nA]
Readout [V]

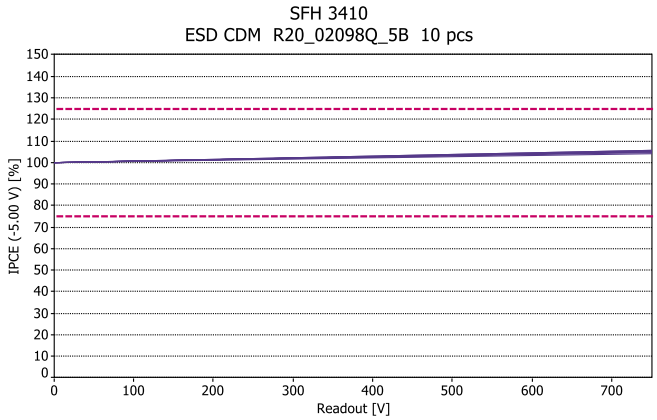
ESD CDM Charged Device Model

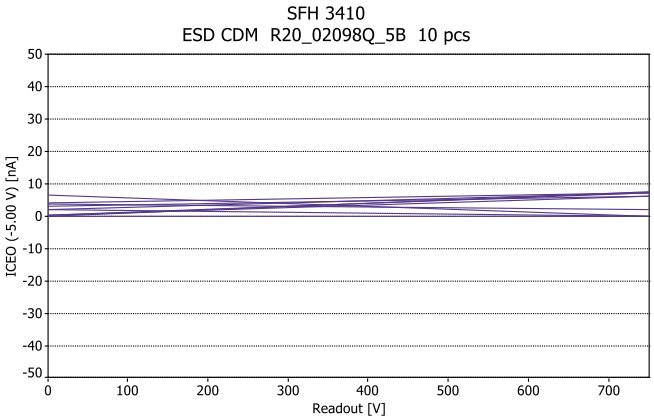
Lot A



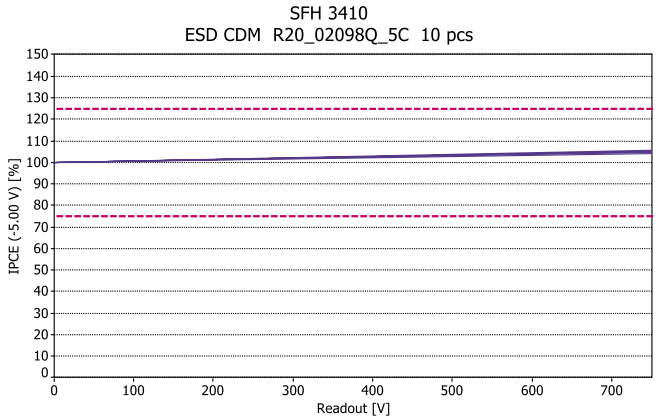


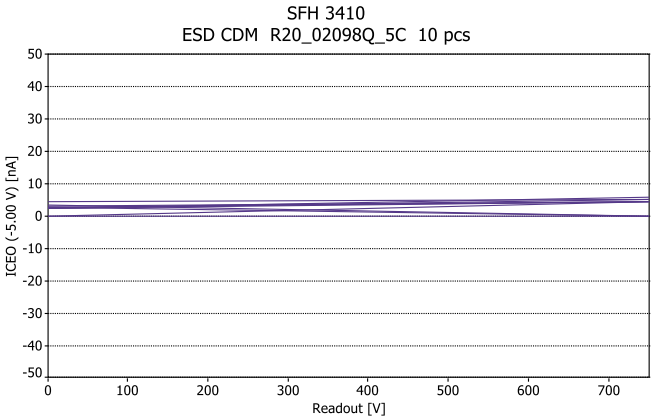
Lot B



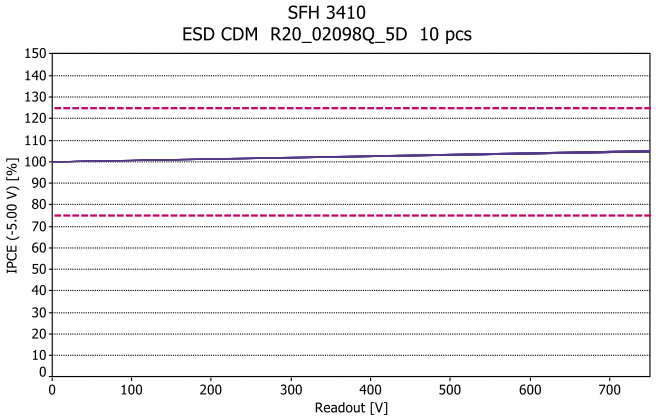


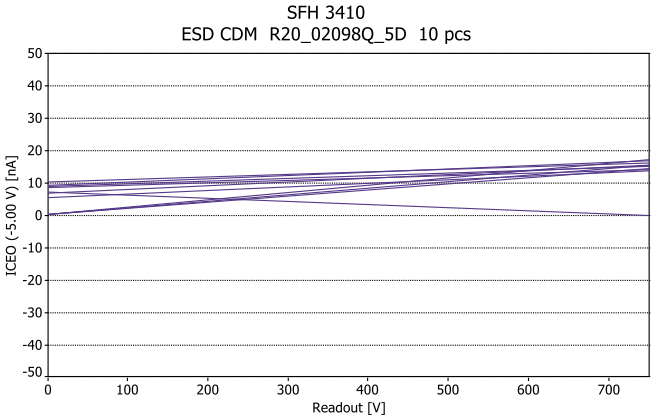
Lot C





Lot D


SFH 3410
ESD CDM R20_02098Q_5D 10 pcs
IPCE (-5.00 V) [%]
Readout [V]


SFH 3410
ESD CDM R20_02098Q_5D 10 pcs
ICEO (-5.00 V) [nA]
Readout [V]

END OF DOCUMENT

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OSRAM SFH 3410

Datasheet

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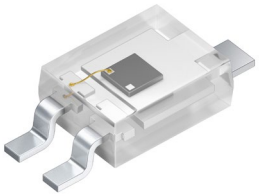
OSRAM

Smart DIL

SFH 3410

Silicon NPN Phototransistor with Vλ Characteristics



Applications

- Ambient Light Sensors
- Displays (Backlighting)
- Mood Lighting

Features

- Package: clear epoxy
- Qualifications: AEC-Q102 Qualified
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Especially suitable for applications from 350 nm to 970 nm
- Adapted to human eye sensitivity (V_λ)
- SMT package without base connection, suitable for IR reflow soldering
- Only available on tape and reel
- Smart-DIL package
- Spectral range of sensitivity: (typ) 350 ... 970 nm

Ordering Information

Type	Photocurrent [1)] V_{CE} = 5 V; Std. Light A; E_v = 20 lx I_{PCE}	Ordering Code
SFH 3410-Z	3.6 ... 22.4 µA	Q65110A1211
SFH 3410-1/2-Z	3.6 ... 9.0 µA	Q65110A2653
SFH 3410-2/3-Z	5.6 ... 14.0 µA	Q65110A2654
SFH 3410-3/4-Z	9.0 ... 22.4 µA	Q65110A2655

Maximum Ratings

T_A = 25 °C

Parameter	Symbol		Values
Operating temperature	T_{op}	min. max.	-40 °C 100 °C
Storage temperature	T_{stg}	min. max.	-40 °C 100 °C
Collector-emitter voltage	V_{CE}	max.	5.5 V
Collector current	I_C	max.	20 mA
Emitter-collector voltage	V_{EC}	max.	0.5 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}	max.	2 kV

Characteristics

T_A = 25 °C

Parameter	Symbol		Values
Wavelength of max sensitivity	$\lambda_{S\ max}$	typ.	600 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	400 ... 950 nm
Dimensions of chip area	L x W	typ.	0.75 x 0.75 mm x mm
Radiant sensitive area	A	typ.	0.29 mm²
Half angle	φ	typ.	60 °
Dark current V_{CE} = 5 V; E = 0	I_{CE0}	typ. max.	6 nA 50 nA
Collector-emitter saturation voltage [2)] $I_C = I_{PCE,min}$ X 0.3; E_v = 20 lx; Std. Light A	V_{CEsat}	typ.	100 mV
Capacitance V_{CE} = 0 V; f = 1 MHz; E = 0	C_{CE}	typ.	3.4 pF

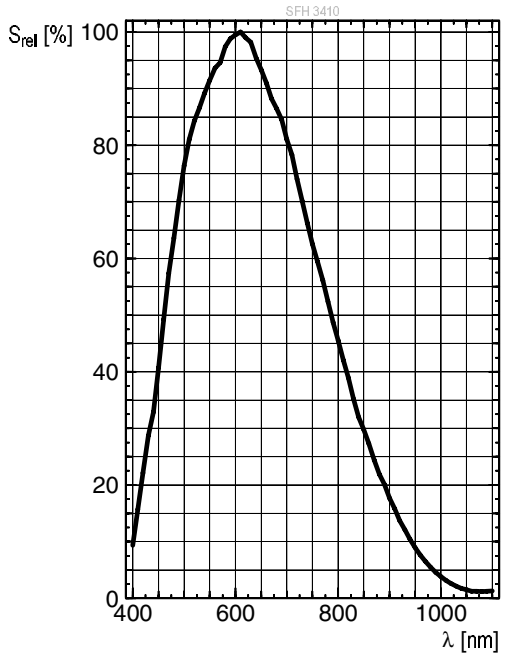
Photocurrent Groups

T_A = 25 °C

Group	Photocurrent [1] V_{CE} = 5 V; Std. Light A; E_v = 20 lx min. I_{PCE}	Photocurrent [1] V_{CE} = 5 V; Std. Light A; E_v = 20 lx max. I_{PCE}
1	3.6 µA	5.6 µA
2	5.6 µA	9.0 µA
3	9.0 µA	14.0 µA
4	14.0 µA	22.4 µA

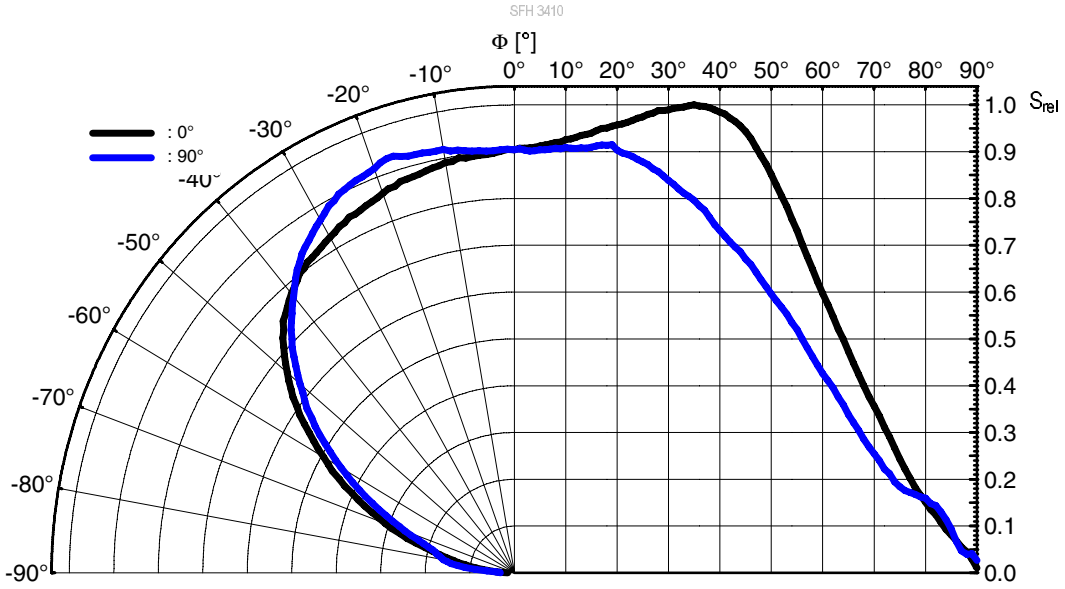
Relative Spectral Sensitivity [3), 4)]

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



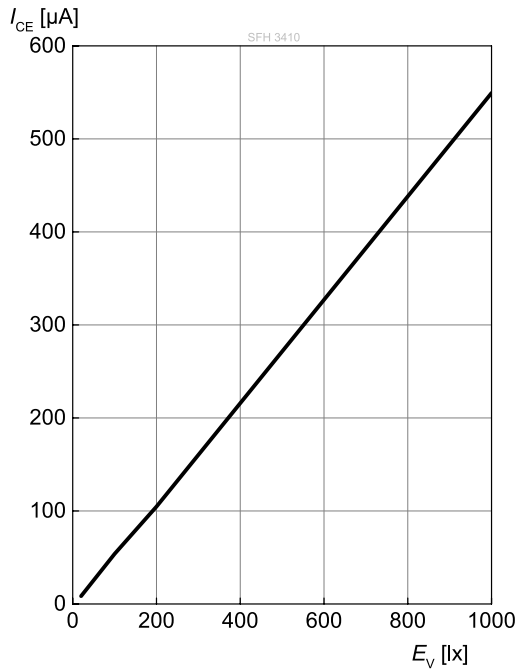
Directional Characteristics [3), 4)]

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



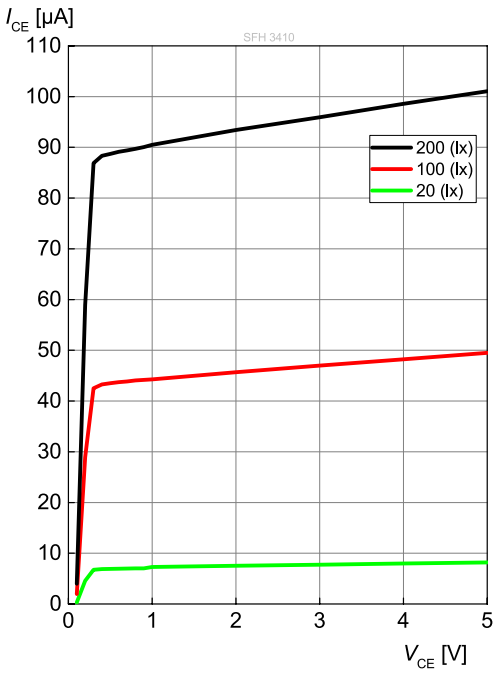
Photocurrent 3), 4)

$I_{PCE} = f(E_v)$; V_{CE} = 5 V; Std. Light A



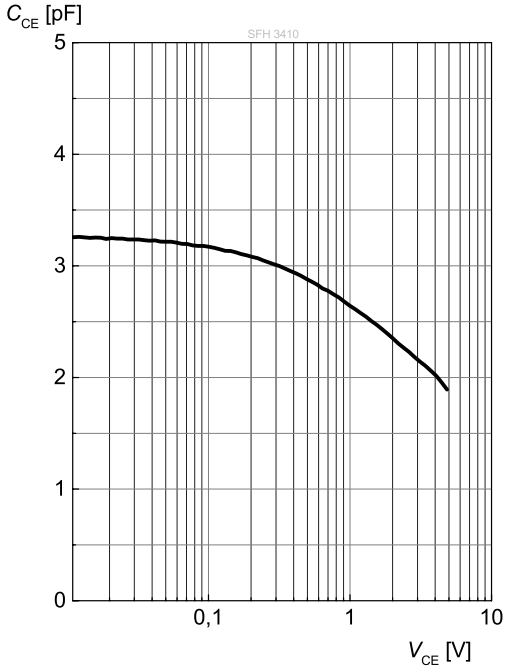
Photocurrent 3), 4)

$I_{CE} = f(V_{CE}, E_v)$; Std. Light A



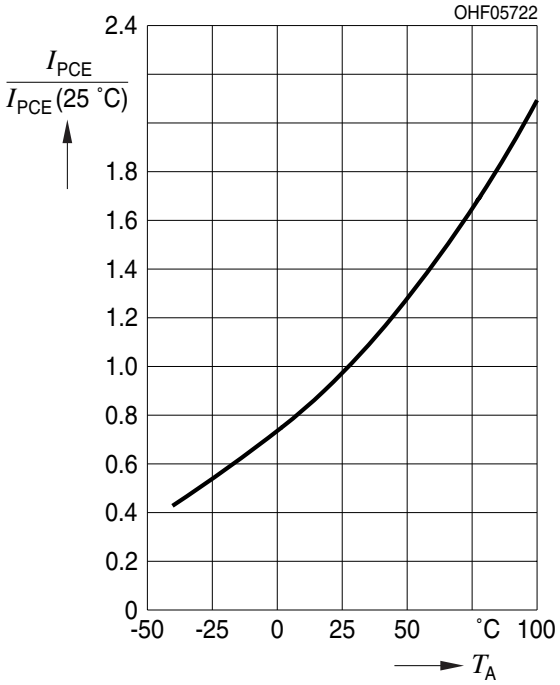
Collector-Emitter Capacitance 3), 4)

$C_{CE} = f(V_{CE})$; f = 1 MHz; E = 0

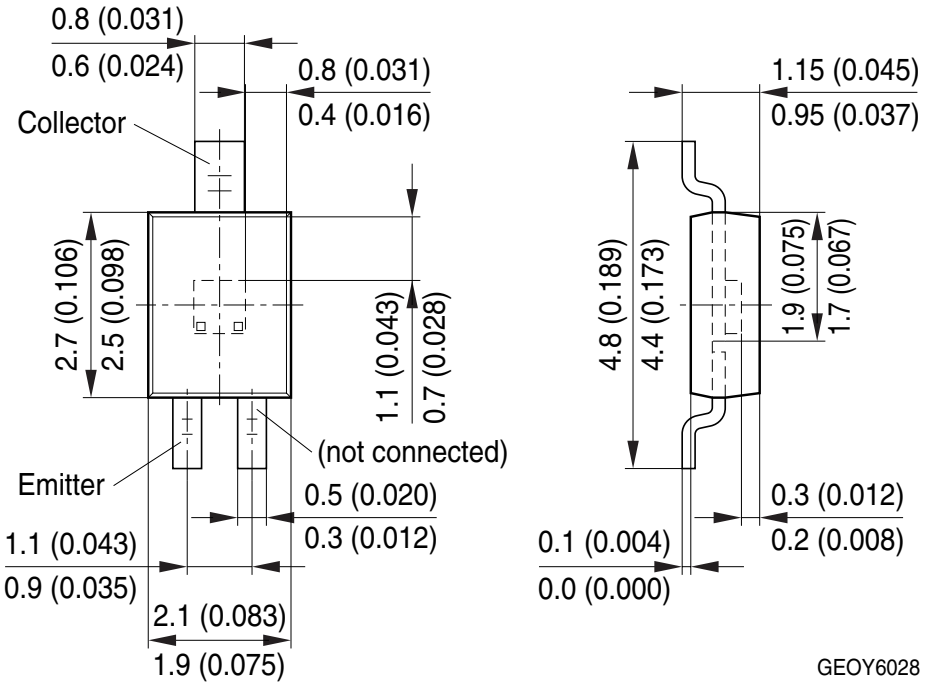


Photocurrent [3)]

$I_{PCE,rel} = f(T_A)$; V_{CE} = 5 V; E_v = 20 lx; Std. Light A



Dimensional Drawing [5)]

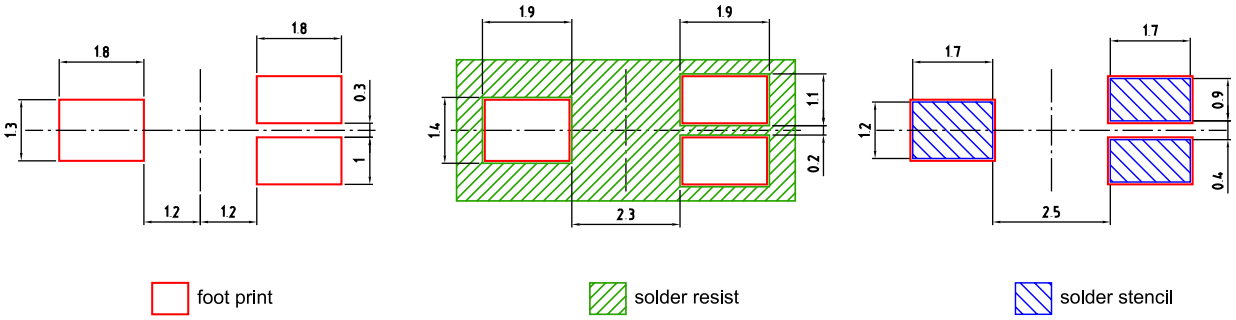


Further Information:

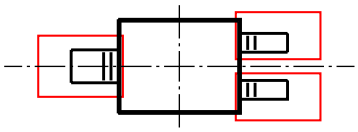
Approximate Weight: 12.0 mg

Package marking: Collector

Recommended Solder Pad [5)]



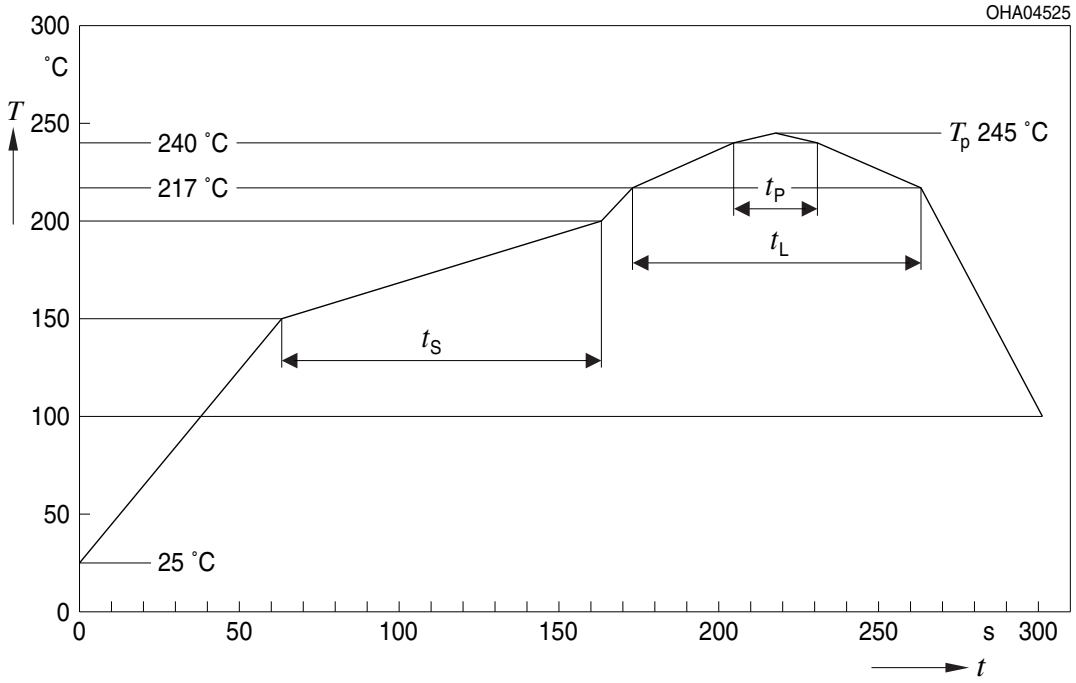
Component Location on Pad



E062.3010.216-01

Reflow Soldering Profile

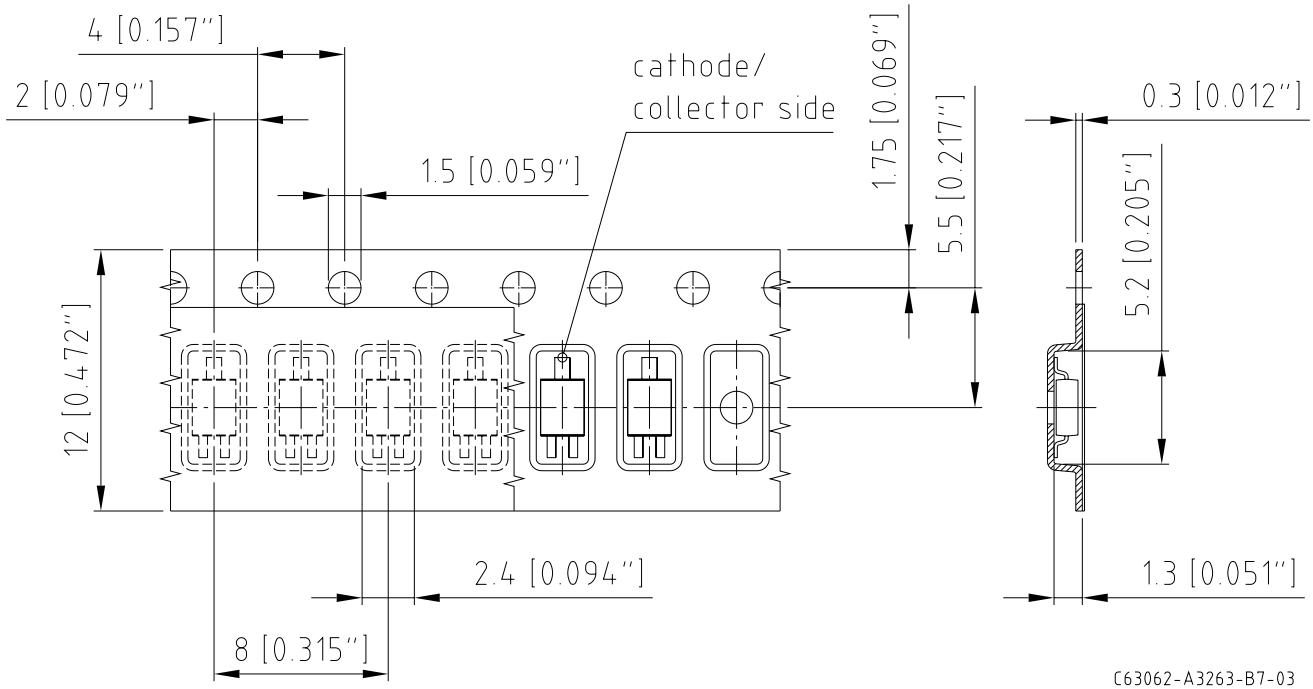
Product complies to MSL Level 4 acc. to JEDEC J-STD-020E



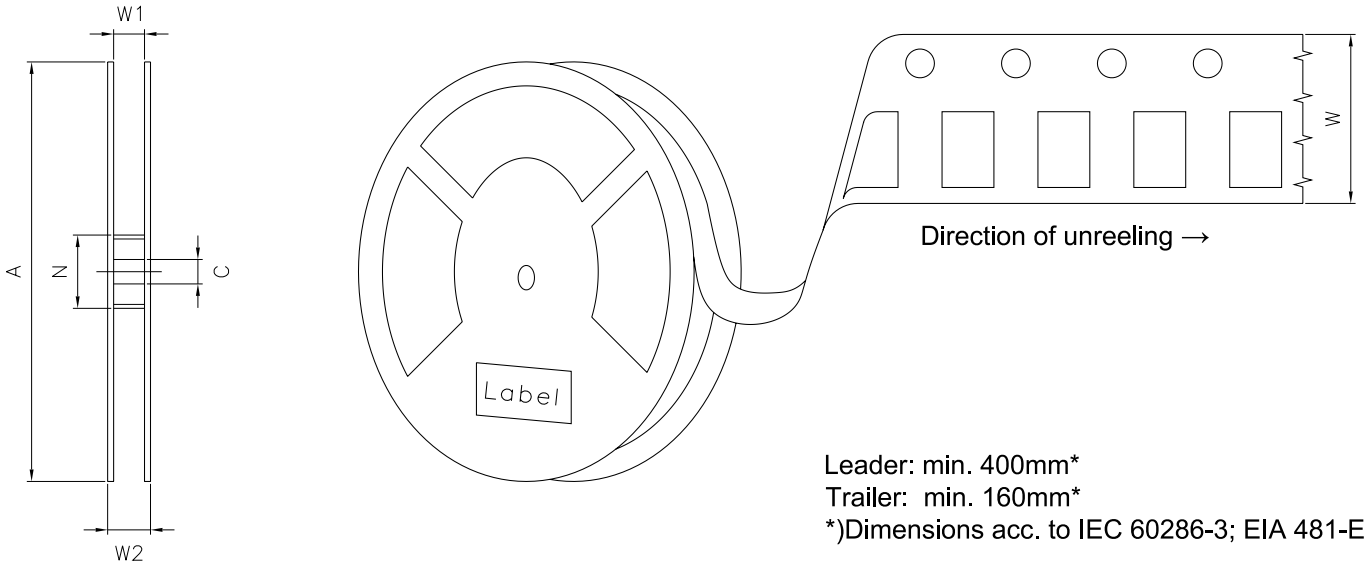
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_S T_{Smin} to T_{Smax}	t_S	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	t_L		80	100	s
Peak temperature	T_P		245	260	°C
Time within 5 °C of the specified peak temperature T_P - 5 K	t_P	10	20	30	s
Ramp-down rate* T_P to 100 °C			3	6	K/s
Time 25 °C to T_P				480	s

All temperatures refer to the center of the package, measured on the top of the component
* slope calculation DT/Dt: Dt max. 5 s; fulfillment for the whole T-range

Taping [5)]


4 [0.157"]
2 [0.079"]
1.5 [0.059"]
cathode/
collector side
1.75 [0.069"]
5.5 [0.217"]
0.3 [0.012"]
5.2 [0.205"]
12 [0.472"]
2.4 [0.094"]
1.3 [0.051"]
8 [0.315"]
C63062-A3263-B7-03

Tape and Reel [6)]

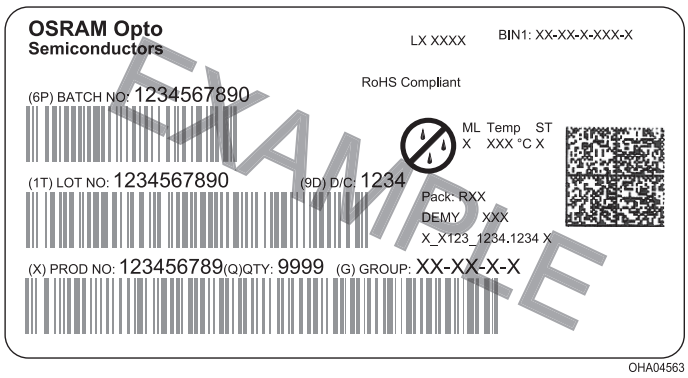


Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

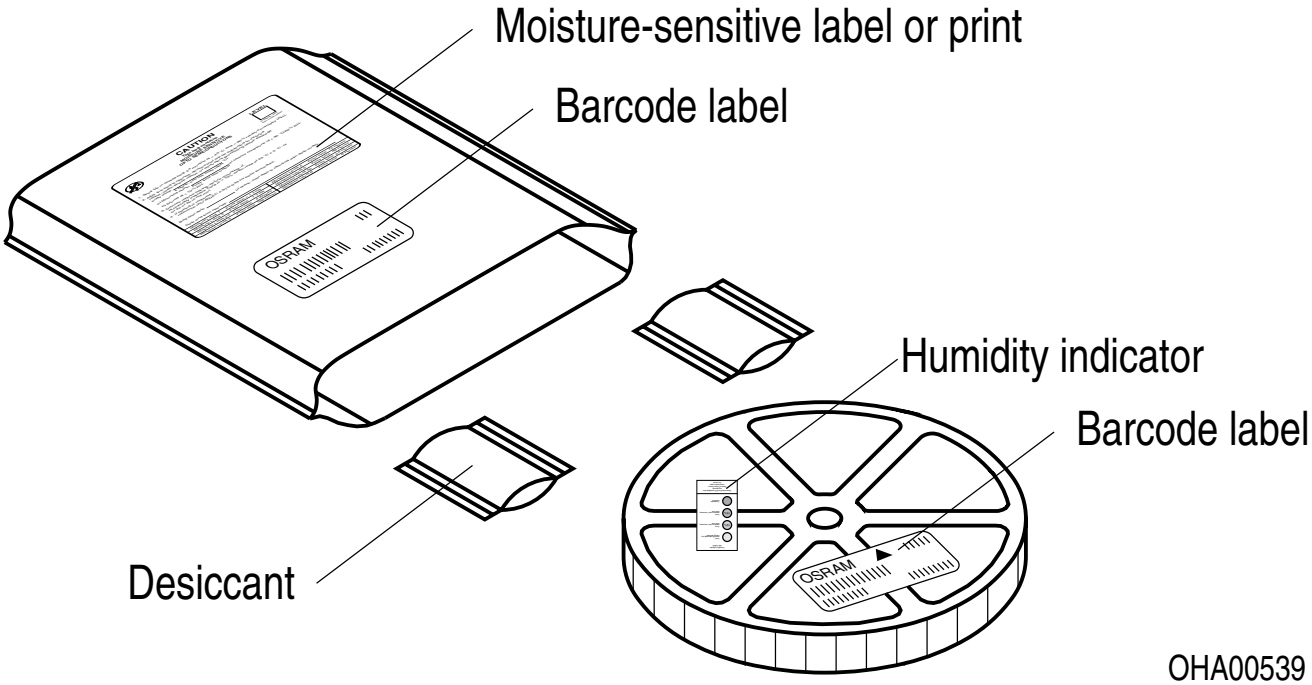
Reel Dimensions

A	W	N_{min}	W_1	$W_{2\,max}$	Pieces per PU
180 mm	12 + 0.3 / - 0.1 mm	60 mm	12.4 + 2 mm	18.4 mm	2000

Barcode-Product-Label (BPL)



Dry Packing Process and Materials [5)]



Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.

Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the device specified in this data sheet fall into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

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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.
If printed or downloaded, please find the latest version on our website.

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.

Product and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.
Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

Glossary

1) **Photocurrent:** The photocurrent values are measured (by irradiating the devices with a homogenous light source and applying a voltage to the device) with a tolerance of ±11 %.

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3) **Typical Values:** Due to the special conditions of the manufacturing processes of semiconductor devices, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

4) **Testing temperature:** TA = 25°C (unless otherwise specified)

5) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ±0.1 and dimensions are specified in mm.

6) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

Revision History

Version	Date	Change
1.4	2021-06-29	Schematic Transportation Box Dimensions of Transportation Box

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。

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OSRAM SFH 3410R

Datasheet

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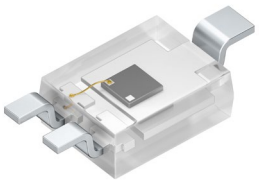
OSRAM

Smart DIL

SFH 3410R

Silicon NPN Phototransistor with Vλ Characteristics



Applications

- Access Control (IRIS/Vein Scan, Face Recognition)
- Backlighting (Smartphone, Tablet)
- Mood Lighting
- Remote Control, Proximity, Ambient Light Sensing

Features

- Package: clear epoxy
- Qualifications: AEC-Q102 Qualified
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Especially suitable for applications from 350 nm to 970 nm
- Adapted to human eye sensitivity (V_λ)
- SMT package without base connection, suitable for IR reflow soldering
- Only available on tape and reel

Ordering Information

Type	Photocurrent [1] V_{CE} = 5 V; Std. Light A; E_v = 20 lx I_{PCE}	Photocurrent [2] typ. V_{CE} = 5 V; Std. Light A; E_v = 20 lx I_{PCE}	Ordering Code
SFH 3410R	3.6 ... 14.0 µA	9 µA	Q65111A9395

Maximum Ratings

T_A = 25 °C

Parameter	Symbol		Values
Operating temperature	T_{op}	min. max.	-40 °C 100 °C
Storage temperature	T_{stg}	min. max.	-40 °C 100 °C
Collector-emitter voltage	V_{CE}	max.	5.5 V
Collector current	I_C	max.	20 mA
Emitter-collector voltage	V_{EC}	max.	0.5 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}	max.	2 kV

Characteristics

T_A = 25 °C

Parameter	Symbol		Values
Wavelength of max sensitivity	$\lambda_{S\ max}$	typ.	600 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	400 ... 950 nm
Dimensions of chip area	L x W	typ.	0.75 x 0.75 mm x mm
Radiant sensitive area	A	typ.	0.29 mm²
Half angle	φ	typ.	60 °
Dark current V_{CE} = 5 V; E = 0	I_{CE0}	typ. max.	6 nA 50 nA
Collector-emitter saturation voltage [3)] $I_C = I_{PCE,min}$ X 0.3; E_v = 20 lx; Std. Light A	V_{CEsat}	typ.	100 mV
Capacitance V_{CE} = 0 V; f = 1 MHz; E = 0	C_{CE}	typ.	3.4 pF

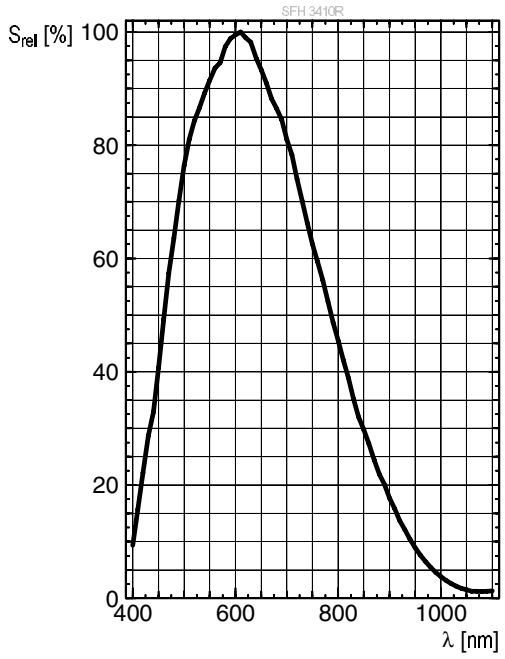
Photocurrent Groups

T_A = 25 °C

Group	Photocurrent [1] V_{CE} = 5 V; Std. Light A; E_v = 20 lx min. I_{PCE}	Photocurrent [1] V_{CE} = 5 V; Std. Light A; E_v = 20 lx max. I_{PCE}
1	3.6 µA	5.6 µA
2	5.6 µA	9.0 µA
3	9.0 µA	14.0 µA

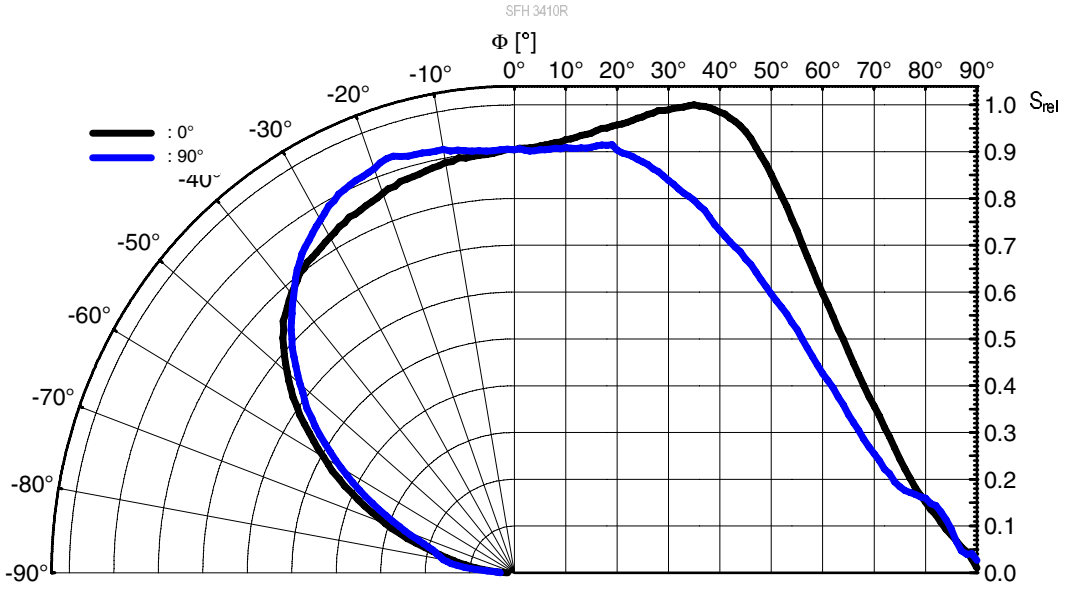
Relative Spectral Sensitivity [4), 5)]

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



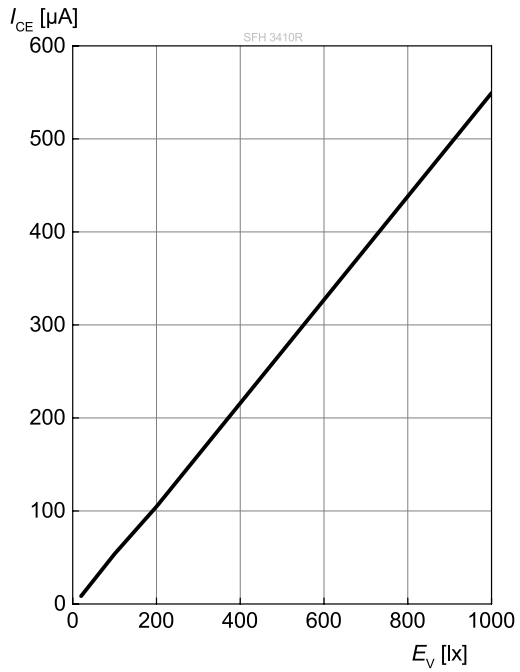
Directional Characteristics [4), 5)]

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



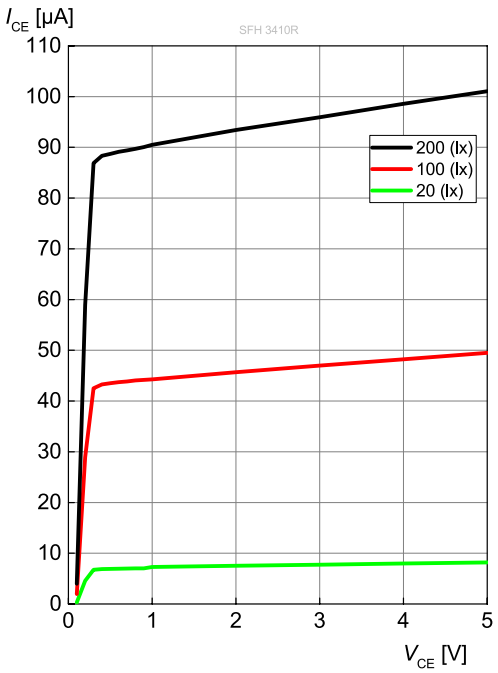
Photocurrent 4), 5)

$I_{PCE} = f(E_v)$; V_{CE} = 5 V; Std. Light A



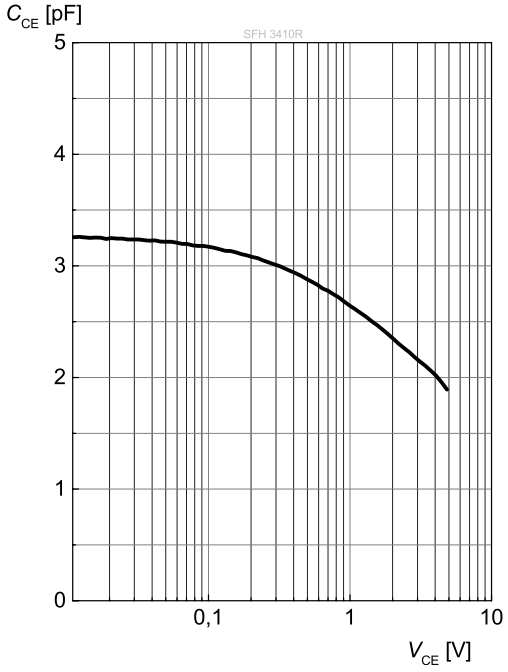
Photocurrent 4), 5)

$I_{CE} = f(V_{CE}, E_v)$; Std. Light A



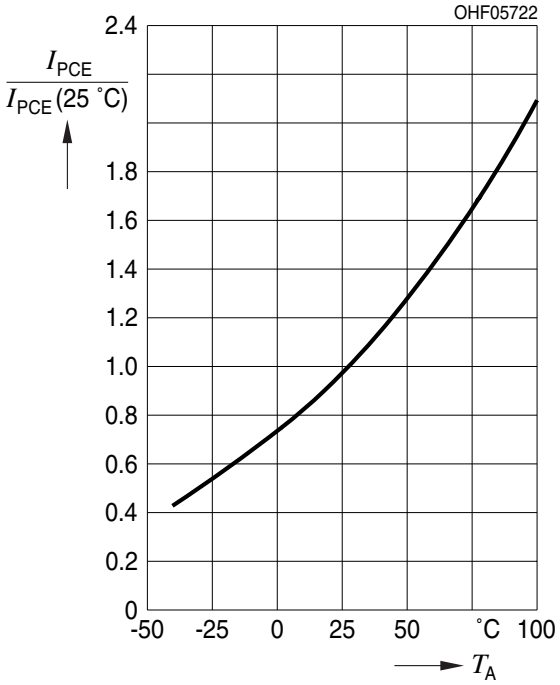
Collector-Emitter Capacitance 4), 5)

$C_{CE} = f(V_{CE})$; f = 1 MHz; E = 0

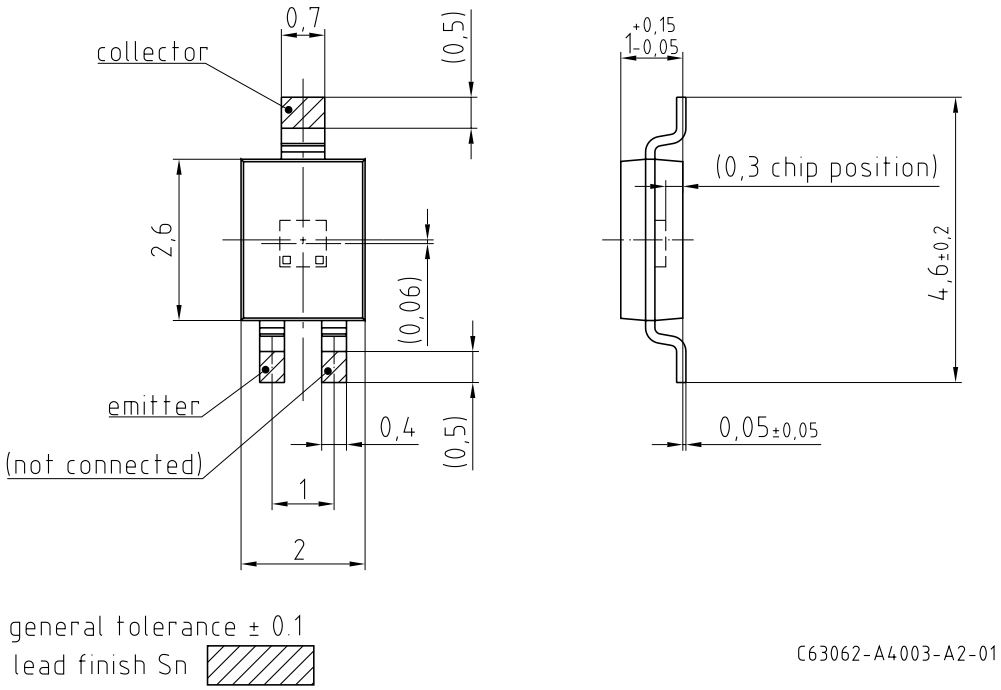


Photocurrent [4)]

$I_{PCE,rel} = f(T_A)$; V_{CE} = 5 V; E_v = 20 lx; Std. Light A



Dimensional Drawing [6)]

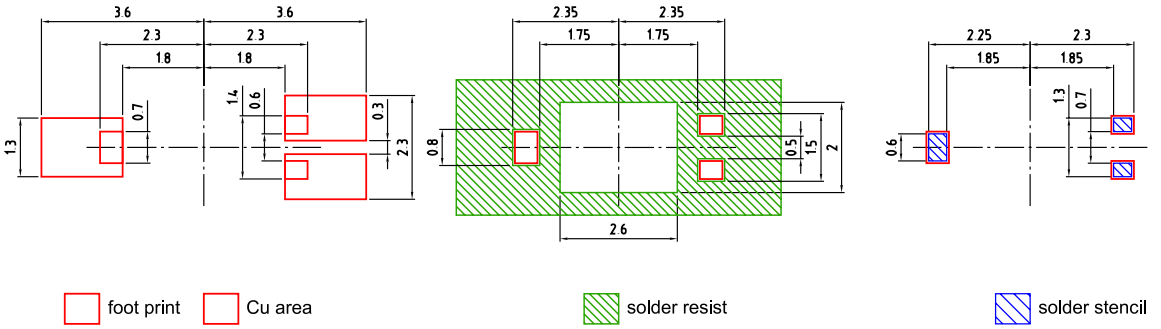


Further Information:

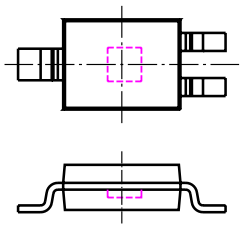
Approximate Weight: 12.0 mg

Package marking: Collector

Recommended Solder Pad [6)]



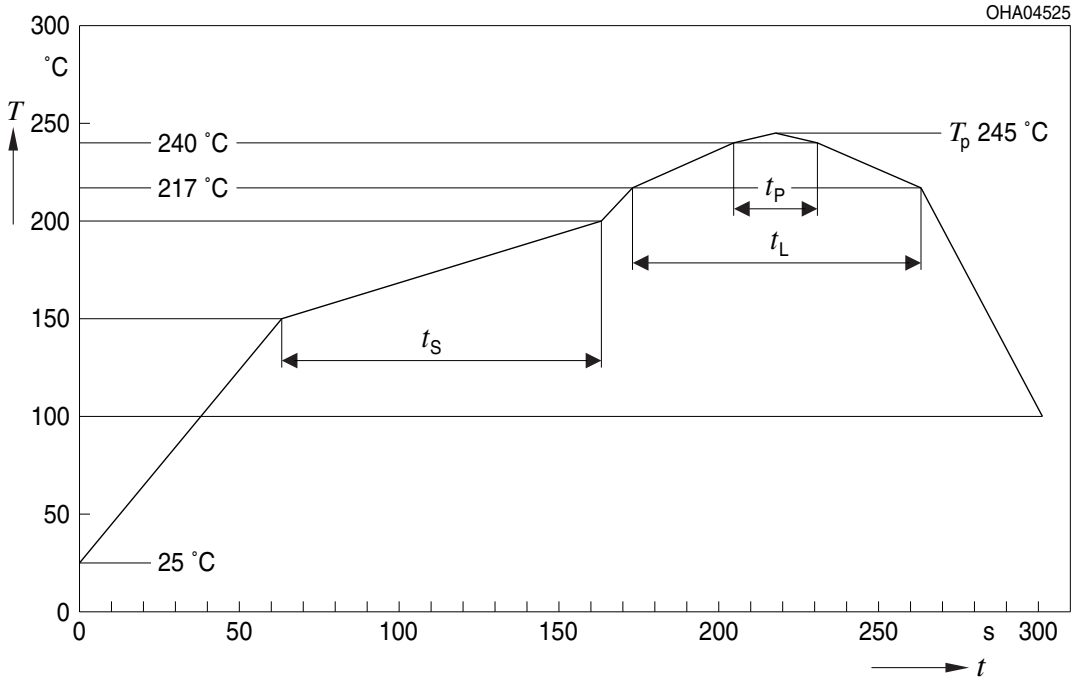
Component Location on Pad



E062.3010.201-01

Reflow Soldering Profile

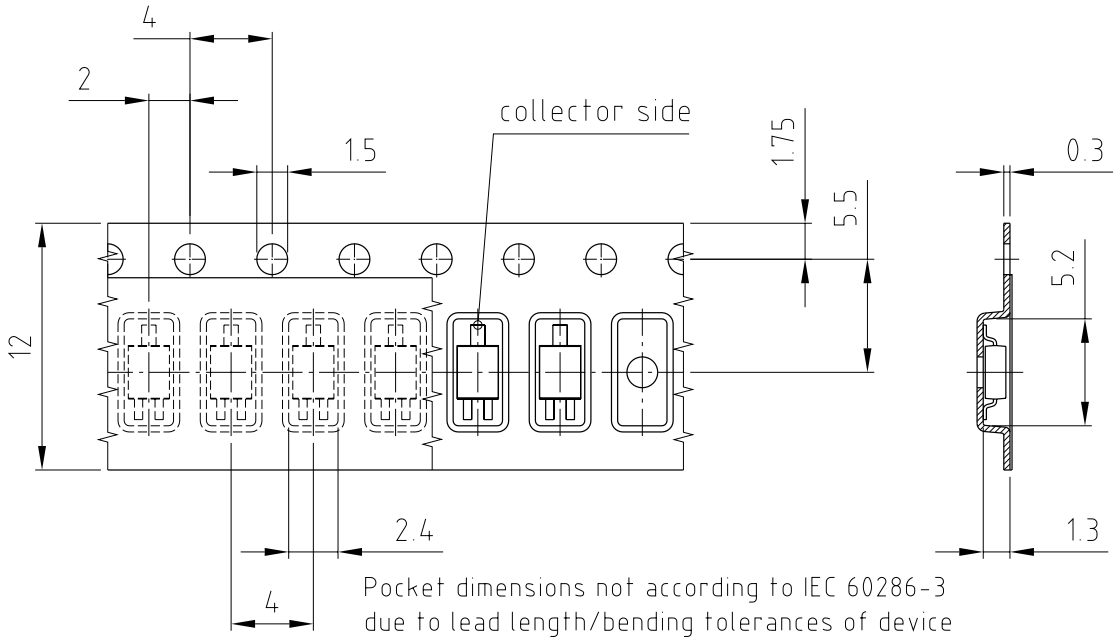
Product complies to MSL Level 4 acc. to JEDEC J-STD-020E



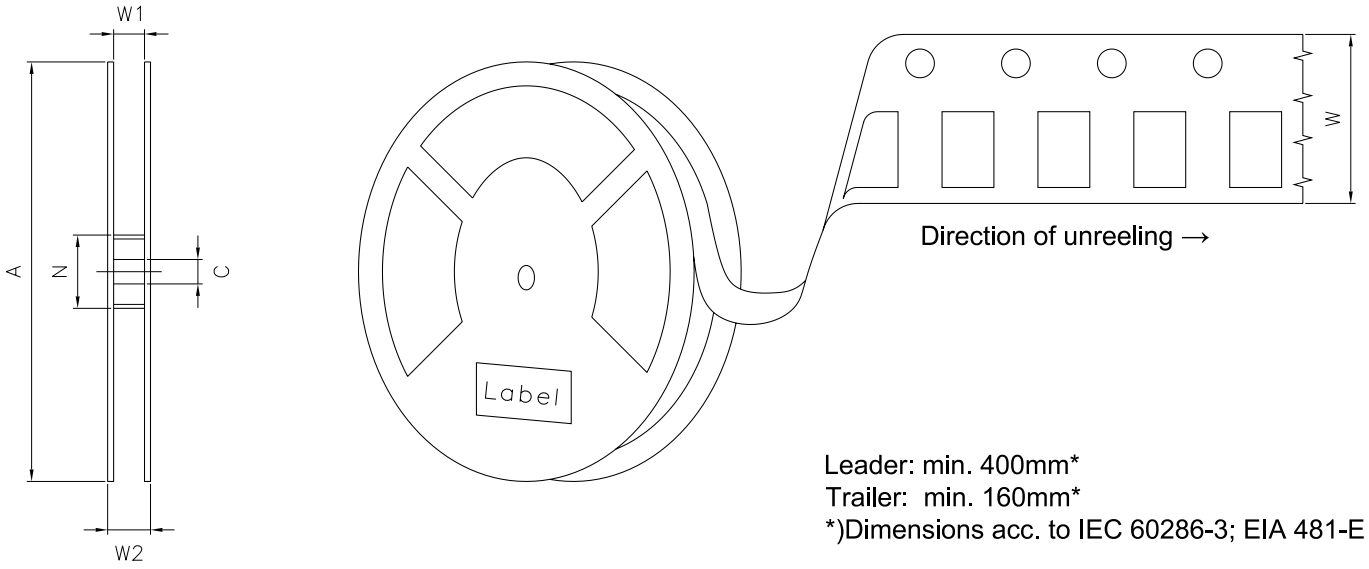
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_S T_{Smin} to T_{Smax}	t_S	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	t_L		80	100	s
Peak temperature	T_P		245	260	°C
Time within 5 °C of the specified peak temperature T_P - 5 K	t_P	10	20	30	s
Ramp-down rate* T_P to 100 °C			3	6	K/s
Time 25 °C to T_P				480	s

All temperatures refer to the center of the package, measured on the top of the component
* slope calculation DT/Dt: Dt max. 5 s; fulfillment for the whole T-range

Taping [6)]


4
2
1.5
collector side
1.75
5.5
0.3
5.2
12
2.4
1.3
4
Pocket dimensions not according to IEC 60286-3
due to lead length/bending tolerances of device
C63062-A4001-B6-03

Tape and Reel [7)]

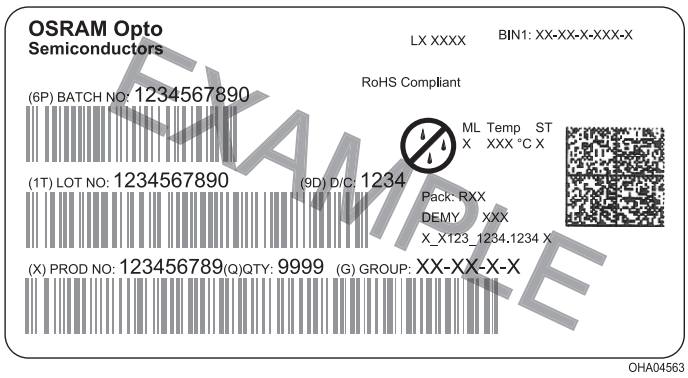


Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

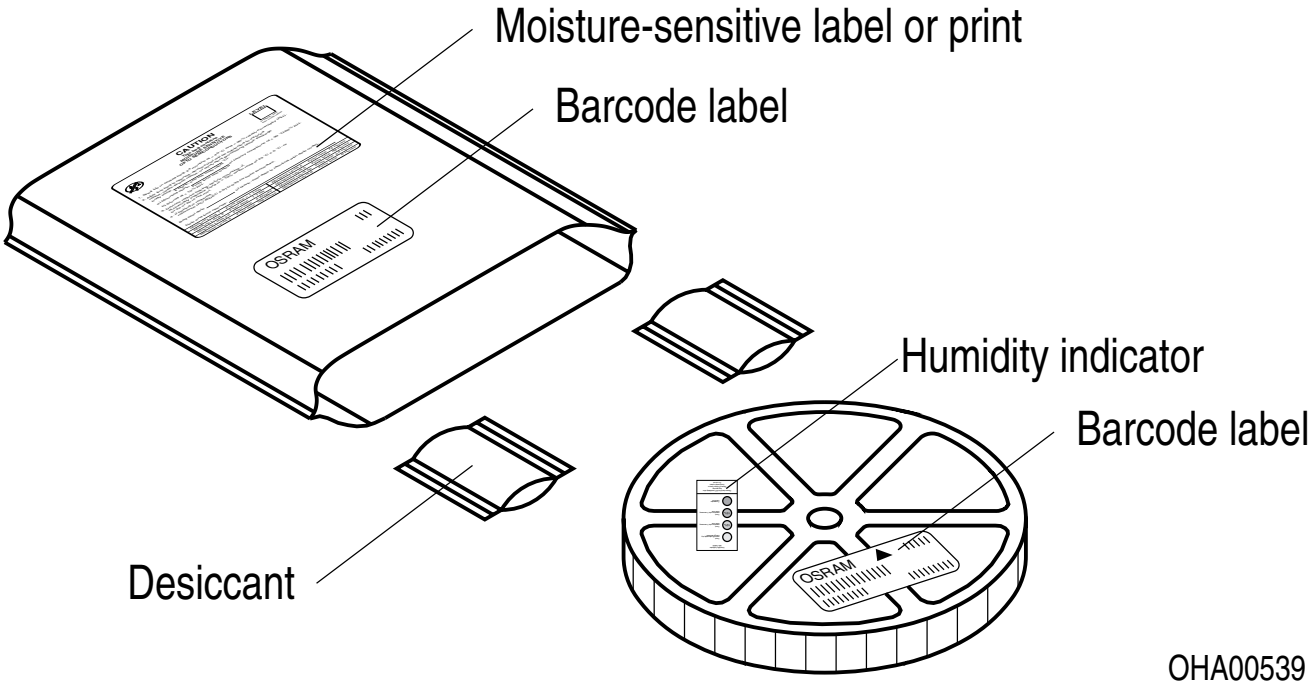
Reel Dimensions

A	W	N_{min}	W_1	$W_{2\,max}$	Pieces per PU
180 mm	12 + 0.3 / - 0.1 mm	60 mm	12.4 + 2 mm	18.4 mm	2000

Barcode-Product-Label (BPL)



Dry Packing Process and Materials [6)]



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Revision History

Version	Date	Change
1.4	2021-06-30	Schematic Transportation Box Dimensions of Transportation Box

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