Light is OSRAM

OSRAM
Opto Semiconductors

01.11.2021

Dear Customer,

please find attached our OSRAM OS PCN:

OS-PCN-2021-016-A
Introduction of next chip generation for vital sign monitoring devices

Important information for your attention:

Please review the **Customer approval form** at the end of the document and provide your feedback to your OSRAM OS sales partner before **03.12.2021**. *)

Your prompt reply will help OSRAM OS to assure a smooth and well executed transition. If OSRAM OS 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.

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

Your attention and response to this matter is highly appreciated.

Please direct your inquiries to your local Sales office.

*) OSRAM OS aligns with the widely-recognized JEDEC STANDARD "JESD46-C", 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. An acceptance or concern response should be submitted to the supplier in a timely fashion, (i.e., customer should not wait to the end of the 90 day review period before responding, if the response is known before that time.)"

OS-PCN-2021-016-A
Introduction of next chip generation for vital sign monitoring devices

Subject of change:	Introduction of next chip generation for vital sign monitoring devices	
Affected products	**Multi Chip LED:** SFH 7015, SFH 7016 **FIREFLY® E1608:** CH DELSS1.22 **BIOFY®:** SFH 7070, SFH 7072	
Reason for change:	• Introduce next red chip generation with improved brightness and lower forward voltage • Introduce next green chip generation with improved brightness and lower forward voltage • Secure continuous supply for future customer demand	
Description of change	Current status	New status
	See device-specific changes documented in file 2_cip_OS-PCN-2021-016-A.	
Product identification:	Date code	
Time schedule for PCN material (after implementation of change):	Final qualification report	available
	Samples available	see 2_cip_OS-PCN-2021-016-A
	Intended Start of delivery	03.12.2021 *) *) 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)	15.03.2022 **) **) expected approval date needs to be available at this time. Lead time and LTO quantity shall be mutually agreed between OSRAM OS and customer.
	Last time delivery date (LTD)	15.08.2022 ***) ***) planned last date for delivery of products of current status
Assessment:	No change in fit, form and reliability	
Documentation:	General: 2_cip_OS-PCN-2021-016-A Multi Chip LED specific: 3_cip_OS-PCN-2021-016-A_qual_Multi_Chip_LED 3_cip_OS-PCN-2021-016-A_Datasheet_SFH_7015 3_cip_OS-PCN-2021-016-A_Datasheet_SFH_7016 FIREFLY® E1608 specific: 4_cip_OS-PCN-2021-016-A_qual_FIREFLY 4_cip_OS-PCN-2021-016-A_Datasheet_ FIREFLY BIOFY® specific: 5_cip_OS-PCN-2021-016-A_qual_BIOFY 5_cip_OS-PCN-2021-016-A_Datasheet_SFH 7070 5_cip_OS-PCN-2021-016-A_Datasheet_SFH 7072	

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
OS-PCN-2021-016-A
Introduction of next chip generation for vital sign monitoring devices

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:** dd.mm.yyyy
- ○ **Volume requirements for Pre-PCN material:**

Sender:

Company:

Address / Location:

Signature: **Date:**

Please return this approval form to your Sales partner.

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OS-PCN-2021-016-A
Introduction of next chip generation for vital sign monitoring devices

Customer information package

OS QM CQM | 01.11.2021

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OS-PCN-2021-016-A
Introduction of next chip generation

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OS-PCN-2021-016-A
Introduction of next chip generation

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1. Reason for change

- Introduce next red chip generation with improved brightness and lower forward voltage
- Introduce next green chip generation with improved brightness and lower forward voltage
- Secure continuous supply for future customer demand
- Change from Luminous Intensity to Radiant Intensity of CH DELSS1.22 for portfolio harmonization

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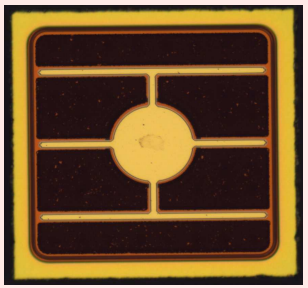
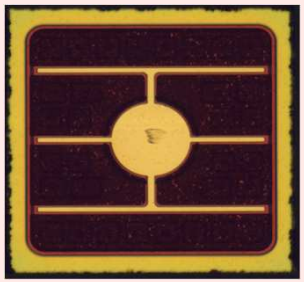
2. Description of red chip change – SFH 7015, SFH 7016, SFH 7072, CH DELSS1.22

	Current status	New status
Wafer Production Line	4“ 	6“
Wafer Substrate	Germanium carrier	Silicon carrier
Height	150µm	120µm
Appearance		

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2. Description of green chip change – SFH 7070, SFH 7072

	Current status	New status
Epitaxie layer version	Current epitaxie layer version	Improved epitaxie layer version

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3. List of affected products

Multi Chip LED	FIREFLY® E1608	BIOFY®
SFH 7015	CH DELSS1.22	SFH 7070
SFH 7016		SFH 7072

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4. PCN Samples

Multi Chip LED	FIREFLY® E1608	BIOFY®
SFH 7015	CH DELSS1.22	SFH 7070
SFH 7016		SFH 7072

available

on request

5. Changes in the datasheets:

Updated Datasheet Versions

Product type	Data sheet version before PCN	Data sheet version after PCN	Publication date
CH DELSS1.22 (w/o Rth update)	1.4	1.5	01.11.2021
CH DELSS1.22 (with Rth update)	-	1.6	15.12.2021
SFH 7015 (w/o Rth update)	1.3	1.4	01.11.2021
SFH 7015 (with Rth update)	-	1.5	15.12.2021
SFH 7016 (w/o Rth update)	1.3	1.4	01.11.2021
SFH 7016 (with Rth update)	-	1.5	15.12.2021
SFH 7070 (w/o Rth update)	1.2	1.3	01.11.2021
SFH 7070 (with Rth update)	-	1.4	15.12.2021
SFH 7072 (w/o Rth update)	1.4	1.5	01.11.2021
SFH 7072 (with Rth update)	-	1.6	15.12.2021

Note 1: Rth values will be updated mid of December with datasheet versions 1.5 due to ongoing measurement. The reference system will change from junction-ambient to junction-solder for more precise planning capability at customer side.

Note 2: After PCN approval and shipment of new material, the new data sheet versions will be valid.
Latest version of data sheet is accessible on OSRAM OS homepage.

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5. Changes in the datasheets: SFH 7015/SFH 7016

Increased brightness for red die

I_F = 20 mA

Current Status

SFH 7015

Type	Brightness [1)2)]
SFH 7015	
• hyper red	• I_e = 2.20 ... 6.75 mW/sr (I_F = 20 mA)
• infrared (940 nm)	• I_e = 1.65 ... 4.05 mW/sr (I_F = 20 mA)

SFH 7016

Type	Brightness [1)2)]
SFH 7016	
• true green	• I_e = 2.20 ... 5.40 mW/sr (I_F = 20 mA)
• hyper red	• I_e = 2.20 ... 6.75 mW/sr (I_F = 20 mA)
• infrared (940 nm)	• I_e = 1.65 ... 4.05 mW/sr (I_F = 20 mA)

New Status

SFH 7015

Type	Brightness [1)2)]
SFH 7015	
• hyper red	• I_e = 2.50 ... 7.00 mW/sr (I_F = 20 mA)
• infrared (940 nm)	• I_e = 1.65 ... 4.05 mW/sr (I_F = 20 mA)

SFH 7016

Type	Brightness [1)2)]
SFH 7016	
• true green	• I_e = 2.20 ... 5.40 mW/sr (I_F = 20 mA)
• hyper red	• I_e = 2.50 ... 7.00 mW/sr (I_F = 20 mA)
• infrared (940 nm)	• I_e = 1.65 ... 4.05 mW/sr (I_F = 20 mA)

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5. Changes in the datasheets: SFH 7015/SFH 7016

Maximum Ratings for red die

T_A = 25 °C

Current Status

SFH 7015

Surge current $t_p \leq 400\ \mu s$; D = 0.005	I_{FSM}	max.	0.6 A	1 A
Reverse voltage [3]	V_R	max.	5 V	5 V
Power consumption	P_{tot}	max.	120 mW	110 mW

SFH 7016

Surge current $t_p \leq 100\ \mu s$; D = 0.005	I_{FSM}	max.	0.75 A	0.6 A	1 A
Reverse voltage [3]	V_R	max.	5 V	5 V	5 V
Power consumption	P_{tot}	max.	90 mW	120 mW	110 mW

New Status

SFH 7015

Forward current pulsed $t_p \leq 2.3$ ms; D ≤ 0.005	$I_{F\ pulse}$	max.	0.3 A	1 A
Reverse voltage [3]	V_R	max.	5 V	5 V
Power consumption	P_{tot}	max.	100 mW	110 mW

SFH 7016

Forward current pulsed $t_p \leq 100\ \mu s$; D ≤ 0.005	$I_{F\ pulse}$	max.	0.75 A	0.3 A	1 A
Reverse voltage [3]	V_R	max.	5 V	5 V	5 V
Power consumption	P_{tot}	max.	90 mW	100 mW	110 mW

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5. Changes in the datasheets: SFH 7015/SFH 7016

Characteristics for red die and green die (SFH 7016 only)

I_F = 20 mA; t_p = 20 ms; T_A = 25 °C

Current Status

SFH 7015

Forward voltage [5]	V_F	min. typ. max.		1.75 V 2.10 V 2.40 V	1.10 V 1.30 V 1.50 V
Reverse current [3] V_R = 5 V	I_R	max.		10 µA	10 µA
Radiant intensity [1)2)] I_F = 20 mA; t_p = 20 ms	I_e	min. typ. max.		2.2 mW/sr 4 mW/sr 6.75 mW/sr	1.65 mW/sr 3 mW/sr 4.05 mW/sr
Total radiant flux [6]	Φ_e	typ.		13 mW	10 mW

SFH 7016

Forward voltage [5]	V_F	min. typ. max.	1.60 V 2.50 V 2.80 V	1.75 V 2.10 V 2.40 V	1.10 V 1.30 V 1.50 V
Reverse current [3] V_R = 5 V	I_R	max.	10 µA	10 µA	10 µA
Radiant intensity [1)2)] I_F = 20 mA; t_p = 20 ms	I_e	min. typ. max.	2.2 mW/sr 4 mW/sr 5.4 mW/sr	2.2 mW/sr 4 mW/sr 6.75 mW/sr	1.65 mW/sr 3 mW/sr 4.05 mW/sr
Total radiant flux [6]	Φ_e	typ.	14 mW	13 mW	11 mW

New Status

SFH 7015

Forward voltage [5]	V_F	min. typ. max.		1.70 V 1.90 V 2.20 V	1.10 V 1.30 V 1.50 V
Reverse current [3] V_R = 5 V	I_R	max.		10 µA	10 µA
Radiant intensity [1)2)] I_F = 20 mA; t_p = 20 ms	I_e	min. typ. max.		2.5 mW/sr 4.2 mW/sr 7 mW/sr	1.65 mW/sr 3 mW/sr 4.05 mW/sr
Total radiant flux [6]	Φ_e	typ.		14 mW	10 mW

SFH 7016

Forward voltage [5]	V_F	min. typ. max.	2.20 V 2.40 V 2.80 V	1.70 V 1.90 V 2.20 V	1.10 V 1.30 V 1.50 V
Reverse current [3] V_R = 5 V	I_R	max.	10 µA	10 µA	10 µA
Radiant intensity [1)2)] I_F = 20 mA; t_p = 20 ms	I_e	min. typ. max.	2.2 mW/sr 4 mW/sr 5.4 mW/sr	2.5 mW/sr 4.2 mW/sr 7 mW/sr	1.65 mW/sr 3 mW/sr 4.05 mW/sr
Total radiant flux [6]	Φ_e	typ.	14 mW	14 mW	11 mW

Note: Rth values will be updated mid of December with datasheet versions 1.5 due to ongoing measurement. The reference system will change from junction-ambient to junction-solder for more precise planning capability at customer side

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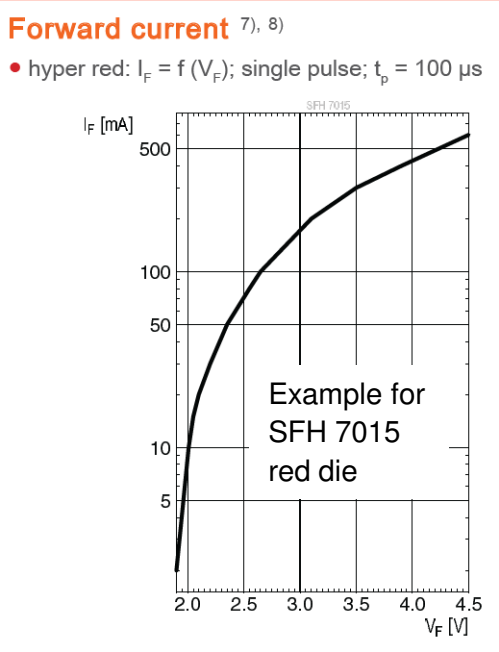
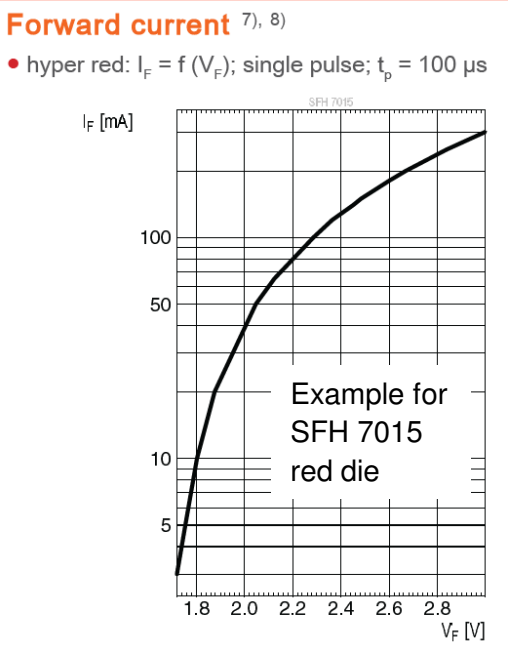
5. Changes in the datasheets: SFH 7015/SFH 7016

Characteristic curves for red and green die

Current Status	New Status
	

Note: Characteristic curves in both datasheets for red and green die have been updated. Please review new datasheets for further details/changes. Shown diagram for current status is only exemplary.

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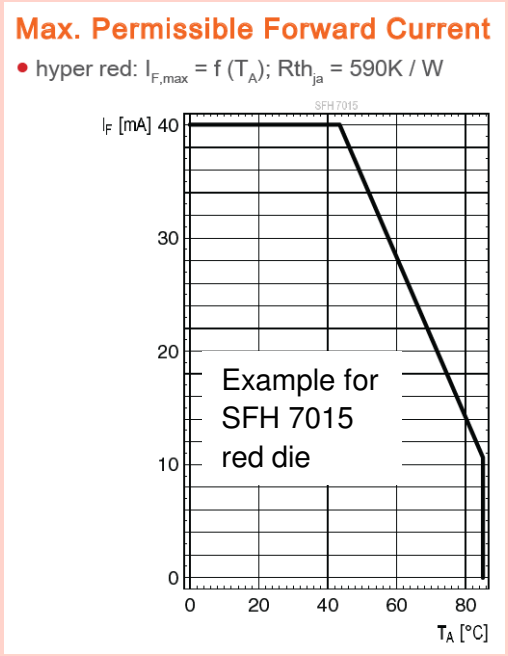
5. Changes in the datasheets: SFH 7015/SFH 7016

Characteristic curves for red and green die

Current Status	New Status
	Characteristic curves for *Max. Permissible Forward Current* and *Permissible Pulse Handling Capability* will be updated mid of December with datasheet versions 1.5 due to ongoing measurement. The reference System will change from junction-ambient to junction-solder for more precise planning capability at customer side. No deterioration of the thermal behavior expected due to the chip change.

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5. Changes in the datasheets: CH DELSS1.22

Change from Luminous Intensity to Radiant Intensity

I_F = 20 mA

Current Status

CH DELSS1.22

Ordering Information

Type	Luminous Intensity [1] I_F = 20 mA I_v	Ordering Code
CH DELSS1.22-S1T2-35	180 ... 450 mcd	Q65112A1192

Brightness Groups

Group	Luminous Intensity [1] I_F = 20 mA min. I_v	Luminous Intensity. [1] I_F = 20 mA max. I_v	Luminous Flux [7] I_F = 20 mA typ. Φ_V
S1	180 mcd	224 mcd	670 mlm
S2	224 mcd	280 mcd	830 mlm
T1	280 mcd	355 mcd	1050 mlm
T2	355 mcd	450 mcd	1330 mlm

New Status

CH DELSS1.22

Ordering Information

Type	Radiant Intensity [1] I_F = 20 mA I_e	Ordering Code
CH DELSS1.22	2.8 ... 7.1 mW/sr	Q65112A1192.

Brightness Groups

Group	Radiant Intensity [1] I_F = 20 mA min. I_e	Radiant Intensity [1] I_F = 20 mA max. I_e
N1	2.8 mW/sr	3.6 mW/sr
N2	3.6 mW/sr	4.5 mW/sr
P1	4.5 mW/sr	5.6 mW/sr
P2	5.6 mW/sr	7.1 mW/sr

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5. Changes in the datasheets: CH DELSS1.22

Maximum Ratings

Current Status

CH DELSS1.22

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min. max.	-40 °C 85 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 85 °C
Junction Temperature	T_j	max.	90 °C
Forward current T_S = 25 °C	I_F	min. max.	1 mA 30 mA
Surge Current t ≤ 10 µs; D = 0.005 ; T_S = 25 °C	I_{FS}	max.	70 mA
Reverse voltage [2] T_S = 25 °C	V_R	max.	12 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}		2 kV

New Status

CH DELSS1.22

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min. max.	-40 °C 85 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 85 °C
Junction Temperature	T_j	max.	90 °C
Forward current T_S = 25 °C	I_F	min. max.	1 mA 30 mA
Forward current pulsed t ≤ 10 µs; D = 0.005 ; T_S = 25 °C	$I_{F\ pulse}$	max.	0.15 A
Reverse voltage [2] T_S = 25 °C	V_R	max.	12 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}		2 kV

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5. Changes in the datasheets: CH DELSS1.22

Characteristics

I_F = 20 mA; T_S = 25 °C

Current Status

CH DELSS1.22

Characteristics

I_F = 20 mA; T_S = 25 °C

Parameter	Symbol		Values
Peak Wavelength	λ_{peak}	typ.	660 nm
Centroid Wavelength [3] I_F = 20 mA	$\lambda_{centroid}$	min. typ. max.	648 nm 657 nm 667 nm
Viewing angle at 50% I_V	2φ	typ.	120 °
Forward Voltage [4] I_F = 20 mA	V_F	min. typ. max.	1.80 V 2.00 V 2.40 V
Reverse current [2] V_R = 12 V	I_R	max.	0.01 µA 10 µA
Real thermal resistance junction/ambient [5][6]	$R_{thJA\ real}$	typ. max.	420 K / W 680 K / W
Real thermal resistance junction/solderpoint [5]	$R_{thJS\ real}$	typ. max.	60 K / W 97 K / W

New Status

CH DELSS1.22

Characteristics

I_F = 20 mA; T_S = 25 °C

Parameter	Symbol		Values
Peak Wavelength	λ_{peak}	typ.	660.0 nm
Centroid Wavelength [3] I_F = 20 mA	$\lambda_{centroid}$	min. typ. max.	648.0 nm 655.0 nm 667.0 nm
Viewing angle at 50% I_V	2φ	typ.	120 °
Total radiant flux [4] I_F = 20 mA	Φ_e	typ.	14 mW
Forward Voltage [5] I_F = 20 mA	V_F	min. typ. max.	1.70 V 1.90 V 2.20 V
Reverse current [2] V_R = 12 V	I_R	typ. max.	0.01 µA 10 µA

Note: Rth values will be updated mid of December with datasheet versions 1.5 due to ongoing measurement. The reference system will change from junction-ambient to junction-solder for more precise planning capability at customer side

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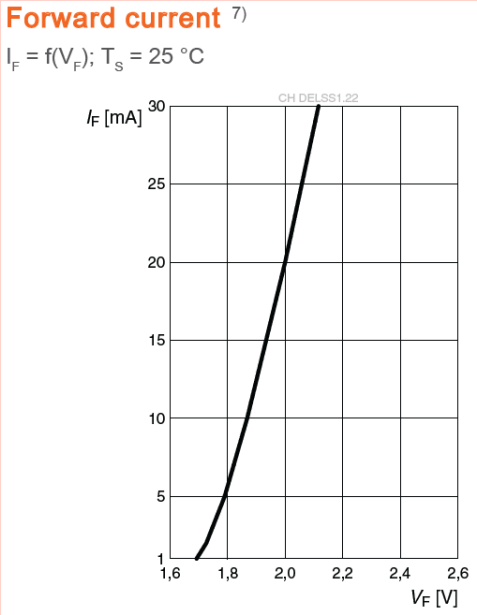
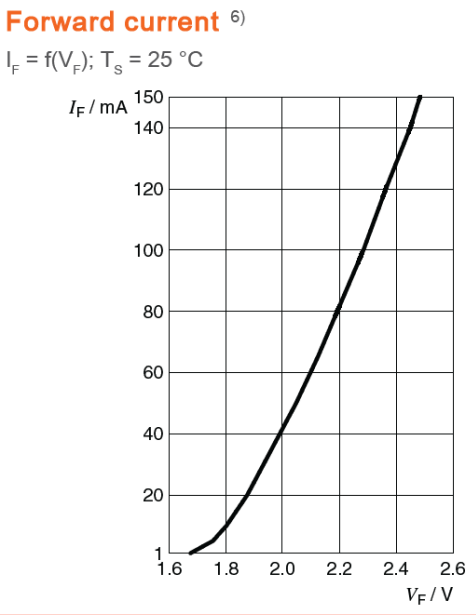
5. Changes in the datasheets: CH DELSS1.22

Characteristic curves

Current Status	New Status
	

Note: Characteristic curves have been updated. Please review new datasheet for further details/changes.
Shown diagram for current status is only exemplary.

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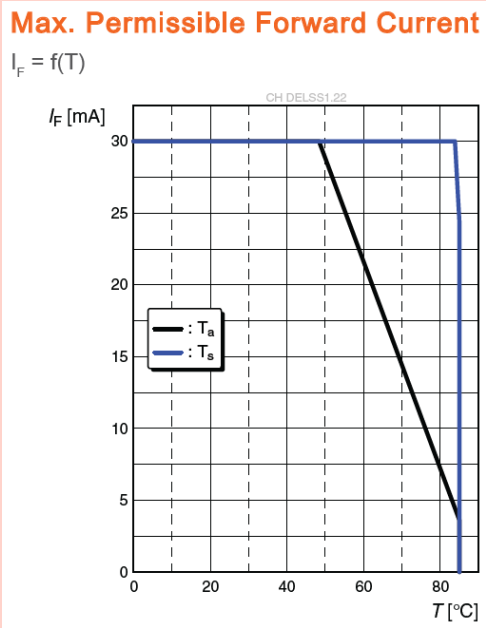
5. Changes in the datasheets: CH DELSS1.22

Characteristic curves

Current Status	New Status
	Characteristic curves for *Max. Permissible Forward Current* and *Permissible Pulse Handling Capability* will be updated mid of December with datasheet versions 1.5 due to ongoing measurement. The reference System will change from junction-ambient to junction-solder for more precise planning capability at customer side. No deterioration of the thermal behavior expected due to the chip change.

5. Changes in the datasheets: SFH 7070/SFH 7072

Maximum Ratings for red die

T_A = 25 °C

Current Status	New Status

SFH 7072

Red Emitter			
Reverse voltage	V_R	max.	12 V
Forward current	$I_{F\ (DC)}$	max.	40 mA
Surge current t_p = 100 µs, D = 0	I_{FSM}	max.	600 mA

SFH 7072

Red Emitter			
Reverse voltage [5)]	V_R	max.	12 V
Forward current	$I_{F\ (DC)}$	max.	40 mA
Forward current pulsed t_p = 300 µs, D = 0.005	$I_{F\ pulse}$	max.	300 mA

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5. Changes in the datasheets: SFH 7072

Characteristics for red die

T_A = 25 °C

Current Status	New Status

SFH 7072 red die

Forward voltage [7]	V_F	typ.	2.1 V
I_F = 20 mA		max.	2.8 V
Reverse current	I_R		not designed for
V_R = 12V			reverse operation
Radiant intensity	I_e	typ.	4.8 mW / sr
I_F = 20 mA, t_p = 20 ms			
Total radiant flux	Φ_e	typ.	14 mW
I_F = 20 mA, t_p = 20 ms			
Temperature coefficient of wavelength	TC$_\lambda$	typ.	0.13 nm / K
I_F = 20 mA, -10°C ≤ T ≤ 100°C			

SFH 7072 red die

Forward voltage [7]	V_F	typ.	1.9 V
I_F = 20 mA		max.	2.2 V
Reverse current	I_R		not designed for
V_R = 12V			reverse operation
Radiant intensity	I_e	typ.	5.1 mW / sr
I_F = 20 mA, t_p = 20 ms			
Total radiant flux	Φ_e	typ.	16 mW
I_F = 20 mA, t_p = 20 ms			
Temperature coefficient of wavelength	TC$_\lambda$	typ.	0.18 nm / K
I_F = 20 mA, -10°C ≤ T ≤ 100°C			

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5. Changes in the datasheets: SFH 7070

Characteristics for green die

T_A = 25 °C

Current Status			
SFH 7070 green die			
Rise time (10% and 90%) I_F = 100 mA, t_p = 16 µs, R_L = 50 Ω	t_r	typ.	56 ns
Fall time (10% and 90%) I_F = 100 mA, t_p = 16 µs, R_L = 50 Ω	t_f	typ.	56 ns
Forward voltage I_F = 20 mA	V_F	typ. max.	3.0 V 3.4 V
Reverse current V_R = 5 V	I_R	.	Not designed for reverse operation
Radiant intensity I_F = 20 mA, t_p = 20 ms	I_e	typ.	3.8 mW / sr
Total radiant flux I_F = 20 mA, t_p = 20 ms	Φ_e	typ.	11.7 mW

New Status			
SFH 7070 green die			
Rise time (10% and 90%) I_F = 100 mA, t_p = 16 µs, R_L = 50 Ω	t_r	typ.	60 ns
Fall time (10% and 90%) I_F = 100 mA, t_p = 16 µs, R_L = 50 Ω	t_f	typ.	60 ns
Forward voltage [7] I_F = 20 mA	V_F	typ. max.	2.4 V 2.8 V
Reverse current V_R = 5 V	I_R	.	Not designed for reverse operation
Radiant intensity I_F = 20 mA, t_p = 20 ms	I_e	typ.	4.8 mW / sr
Total radiant flux I_F = 20 mA, t_p = 20 ms	Φ_e	typ.	15 mW

5. Changes in the datasheets: SFH 7072

Characteristics for green die

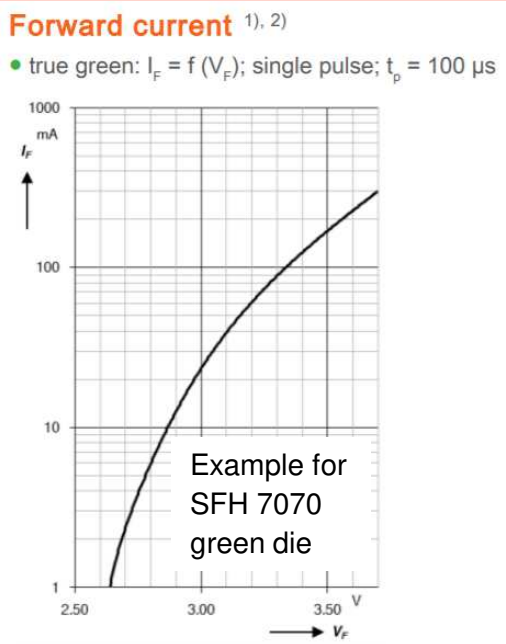
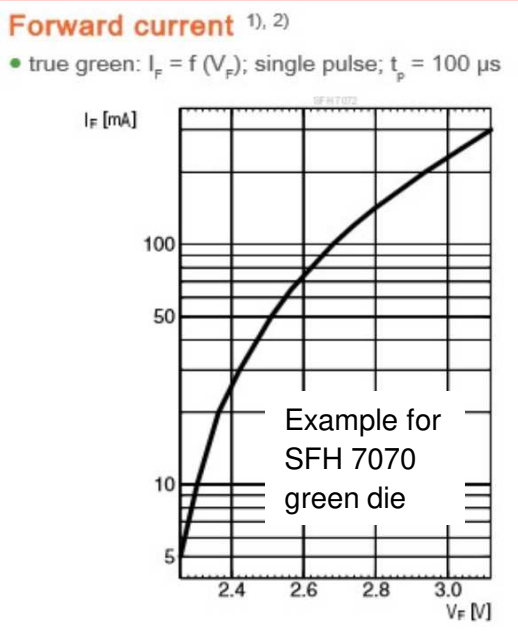
T_A = 25 °C

Current Status			
SFH 7072 green die			
Rise time I_F = 100 mA, t_p = 16µs, R_L = 50 Ω	t_r	typ.	56 ns
Fall time I_F = 100 mA, t_p = 16µs, R_L = 50 Ω	t_f	typ.	56 ns
Forward voltage [7] I_F = 20 mA	V_F	typ. max.	3.0 V 3.4 V
Reverse current V_R = 5 V	I_R		not designed for reverse operation
Radiant intensity I_F = 20 mA, t_p = 20 ms	I_e	typ.	3.8 mW / sr
Total radiant flux I_F = 20 mA, t_p = 20 ms	Φ_e	typ.	11 mW

New Status			
SFH 7072 green die			
Rise time I_F = 100 mA, t_p = 16µs, R_L = 50 Ω	t_r	typ.	60 ns
Fall time I_F = 100 mA, t_p = 16µs, R_L = 50 Ω	t_f	typ.	60 ns
Forward voltage [7] I_F = 20 mA	V_F	typ. max.	2.4 V 2.8 V
Reverse current V_R = 5 V	I_R		not designed for reverse operation
Radiant intensity I_F = 20 mA, t_p = 20 ms	I_e	typ.	4.7 mW / sr
Total radiant flux I_F = 20 mA, t_p = 20 ms	Φ_e	typ.	14 mW

5. Changes in the datasheets: SFH 7070/SFH 7072

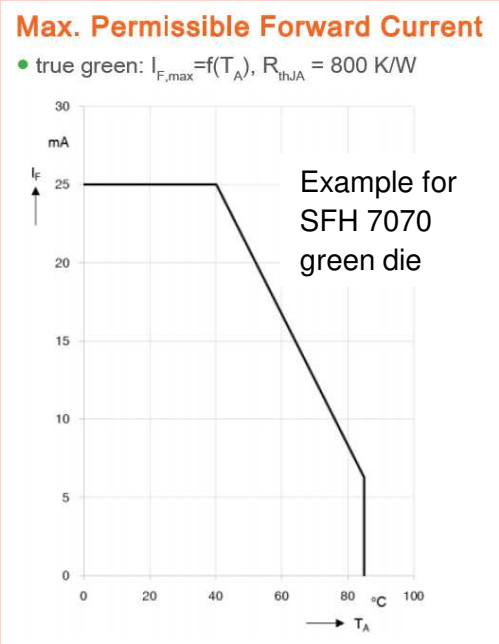
Characteristic curves for red and green die

Current Status	New Status
	

Note: Characteristic curves in both datasheets for red and green die have been updated. Please review new datasheets for further details/changes. Shown diagram for current status is only exemplary.

5. Changes in the datasheets: SFH 7070/SFH 7072

Characteristic curves

Current Status	New Status
	Characteristic curves for *Max. Permissible Forward Current* and *Permissible Pulse Handling Capability* will be updated mid of December with datasheet versions 1.5 due to ongoing measurement. The reference System will change from junction-ambient to junction-solder for more precise planning capability at customer side. No deterioration of the thermal behavior expected due to the chip change.

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6. Time schedule

for <u>PCN material</u> (after implementation of change):	Final qualification reports	available
	Samples available	yes
	Intended Start of delivery	03.12.2021*) *) or earlier if released by customer and upon mutual agreement
for <u>Pre-PCN material</u> (prior to implementation of change):	Last time order date (LTO)	15.03.2022**) **) expected approval date needs to be available at this time. Lead time and LTO quantity shall be mutually agreed between OSRAM OS and customer.
	Last time delivery date (LTD)	15.08.2022***) ***) planned last date for delivery of products of current status

<u>Note:</u>
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.

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Thank you.

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Opto Semiconductors

Material (Q-no.)	MQD	Device Family	Brand
Q65112A1192	CH DELSS1.22-S1T2-35-0-20-R18	CH DELSS1_2x	FIREFLY
Q65112A7153	CH DELSS1.22-S2T2-34-0-20-R18-XX	CH DELSS1_2x	FIREFLY
Q65112A7658	SFH 7015	SFH 7015	Multi Chip LED
Q65113A4161	SFH 7015 C1099	SFH 7015	Multi Chip LED
Q65112A7849	SFH 7016	SFH 7016	Multi Chip LED
Q65113A2853	SFH 7016 C1004	SFH 7016	Multi Chip LED
Q65113A1859	SFH 7016 C1018	SFH 7016	Multi Chip LED
Q65113A4162	SFH 7016 C1099	SFH 7016	Multi Chip LED
Q65111A9887	SFH 7070	SFH 7070	BIOFY
Q65112A1516	SFH 7072	SFH 7072	BIOFY