Light is OSRAM

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Opto Semiconductors

17.05.2021

Dear Customer,

please find attached our OSRAM OS PCN:

OS-PCN-2021-014-A
Introduction of next generation IR Thinfilm chip for SYNIOS P2720 SFH 4775S

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 **01.07.2021**. *)

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-2021-014-A
Introduction of next generation IR Thinfilm chip for SYNIOS P2720 SFH 4775S

Subject of change:	Introduction of next generation IR Thinfilm chip for SYNIOS P2720 SFH 4775S	
Affected products	SFH 4775S	
Reason for change:	• Fulfill market demands for higher brightness • Ensure continuous supply • Capacity increase	
Description of change	Please refer to attached 2_cip_OS-PCN-2021-014-A	
Product identification:	Date code / Laser marking on device	
Time schedule for PCN material (after implementation of change):	Final qualification report	available
	Samples available	yes
	Intended Start of delivery	15.08.2021 *) *) 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)	31.07.2021 **) **) 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)	31.10.2021 ***) ***) planned last date for delivery of products of current status

Assessment:	Datasheet will be updated accordingly
Documentation:	2_cip_OS-PCN-2021-014-A 3_qual_OS-PCN-2021-014-AI

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-2021-014-A
Introduction of next generation IR Thinfilm chip for SYNIOS P2720 SFH 4775S

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-2021-014-A
Introduction of next generation IR Thinfilm chip for SYNIOS P2720 SFH 4775S
Customer information package

OS QM CQM | 17.05.2021

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OS-PCN-2021-014-A
Overview

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OS-PCN-2021-014-A
Introduction of next generation IR Thinfilm chip

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Reason for change

Introduction of latest chip generation to

- Fulfill market demands for higher brightness
- Ensure continuous supply
- Capacity increase

Affected product

- SYNIOS P2720: SFH 4775S

Assessment

The new chip generation is already phased in for other SYNIOS P2720 and OSLON Black Series types as per OS-PCN-2019-015-A.

OS-PCN-2021-014-A
Introduction of next generation IR Thinfilm chip

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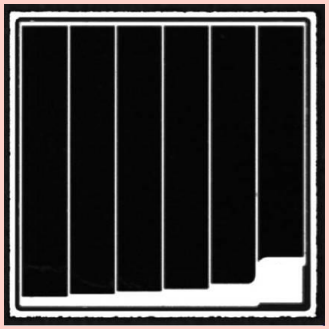
Description of change

	Current status	New status
Production location	Regensburg / Germany	Regensburg / Germany
Chip dimensions	1000µm x 1000µm x 120µm	1000µm x 1000µm x 120µm
Substrate	Si-carrier	Si-carrier
Wafer diameter	150mm	150mm
Chip picture		

OS-PCN-2021-014-A
Introduction of next generation IR Thinfilm chip

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Changes in the datasheet:

Product type	Data sheet version before PCN	Data sheet version after PCN
SFH 4775S	1.3	1.4

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 OSRAM OS homepage.

OS-PCN-2021-014-A
Introduction of next generation IR Thinfilm chip

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Changes in the datasheet

Before PCN

Type	Total radiant flux [1)2)] I_F = 1000 mA; t_p = 10 ms Φ_e	Total radiant flux [1)] typ. I_F = 1000 mA; t_p = 10 ms Φ_e
SFH 4775S	1000 ... 1600 mW	1,150 mW

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
Junction temperature	T_j	max.	145 °C
Forward current	I_F	max.	1500 mA
Surge current $t_p \leq 1.5$ ms; D = 0.005	I_{FSM}	max.	3 A
Reverse current [3)]	I_R	max.	200 mA
Power consumption	P_{tot}	max.	5800 mW
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}	max.	2 kV

After PCN

Type	Total radiant flux [1)2)] I_F = 1000 mA; t_p = 10 ms Φ_e	Total radiant flux [1)] typ. I_F = 1000 mA; t_p = 10 ms Φ_e
SFH 4775S	1120 ... 1600 mW	1,360 mW

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
Junction temperature	T_j	max.	145 °C
Forward current	I_F	max.	1500 mA
Surge current testcondition: tbd	I_{FSM}	max.	3 A
Reverse current [3)]	I_R	max.	200 mA
Power consumption	P_{tot}	max.	5400 mW
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}	max.	2 kV

OS-PCN-2021-014-A

Introduction of next generation IR Thinfilm chip

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Changes in the datasheet

Before PCN

Characteristics

I_F = 1000 mA; t_p = 10 ms; T_A = 25 °C

Parameter	Symbol		Values
Peak wavelength	λ_{peak}	typ.	950 nm
Centroid wavelength	$\lambda_{centroid}$	typ.	940 nm
Spectral bandwidth at 50% $I_{rel,max}$ (FWHM)	$\Delta\lambda$	typ.	37 nm
Half angle	φ	typ.	60 °
Dimensions of active chip area	L x W	typ.	1 x 1 mm x mm
Rise time (10% / 90%) I_F = 3 A; R_L = 50 Ω	t_r	typ.	11 ns
Fall time (10% / 90%) I_F = 3 A; R_L = 50 Ω	t_f	typ.	14 ns
Forward voltage [4]	V_F	typ. max.	2.8 V 3.5 V
Forward voltage [4] I_F = 1.5 A; t_p = 100 µs	V_F	typ. max.	2.95 V 3.75 V
Forward voltage [4] I_F = 3 A; t_p = 100 µs	V_F	typ. max.	3.3 V 4.6 V
Reverse voltage [3] I_R = 20 mA	V_R	max.	1.2 V
Reverse voltage (ESD device) [3]	$V_{R\ ESD}$	min.	5 V
Radiant intensity [5] I_F = 1000 mA; t_p = 10 ms	I_e	typ.	360 mW/sr
Radiant intensity [5] I_F = 1.5 A; t_p = 100 µs	I_e	typ.	545 mW/sr
Total radiant flux [1] I_F = 1.5 A; t_p = 100 µs	Φ_e	typ.	1720 mW
Temperature coefficient of voltage	TC_V	typ.	-2 mV / K
Temperature coefficient of brightness	TC_I	typ.	-0.3 % / K
Temperature coefficient of wavelength	TC_λ	typ.	0.3 nm / K
Thermal resistance junction solder point real [6]	$R_{thJS\ real}$	max.	9.0 K / W

After PCN

Characteristics

I_F = 1000 mA; t_p = 10 ms; T_A = 25 °C

Parameter	Symbol		Values
Peak wavelength	λ_{peak}	typ.	950 nm
Centroid wavelength	$\lambda_{centroid}$	typ.	940 nm
Spectral bandwidth at 50% $I_{rel,max}$ (FWHM)	$\Delta\lambda$	typ.	37 nm
Half angle	φ	typ.	60 °
Dimensions of active chip area	L x W	typ.	1 x 1 mm x mm
Rise time (10% / 90%) I_F = 3 A; R_L = 50 Ω	t_r	typ.	12 ns
Fall time (10% / 90%) I_F = 3 A; R_L = 50 Ω	t_f	typ.	15 ns
Forward voltage [4]	V_F	typ. max.	2.9 V 3.4 V
Forward voltage [4] I_F = 1.5 A; t_p = 100 µs	V_F	typ. max.	3.05 V 3.6 V
Forward voltage [4] I_F = 3 A; t_p = 100 µs	V_F	typ. max.	3.5 V 4.2 V
Reverse voltage [3] I_R = 20 mA	V_R	max.	1.2 V
Reverse voltage (ESD device) [3]	$V_{R\ ESD}$	min.	5 V
Radiant intensity [5]	I_e	typ.	420 mW/sr
Radiant intensity [5] I_F = 1.5 A; t_p = 100 µs	I_e	typ.	620 mW/sr
Total radiant flux [1] I_F = 1.5 A; t_p = 100 µs	Φ_e	typ.	2000 mW
Temperature coefficient of voltage	TC_V	typ.	-2 mV / K
Temperature coefficient of brightness	TC_I	typ.	-0.3 % / K
Temperature coefficient of wavelength	TC_λ	typ.	0.3 nm / K
Thermal resistance junction solder point real [6]	$R_{thJS\ real}$	max.	9.0 K / W

*Rth under verification

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OS-PCN-2021-014-A
Introduction of next generation IR Thinfilm chip

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Changes in the datasheet

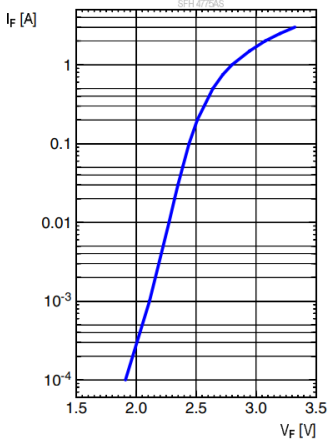
Before PCN

Brightness Groups

Group	Total radiant flux [1)2)] I_F = 1000 mA; t_p = 10 ms min. Φ_e	Total radiant flux [1)2)] I_F = 1000 mA; t_p = 10 ms max. Φ_e
EB2	1000 mW	1120 mW
FA1	1120 mW	1250 mW
FA2	1250 mW	1400 mW
FB1	1400 mW	1600 mW

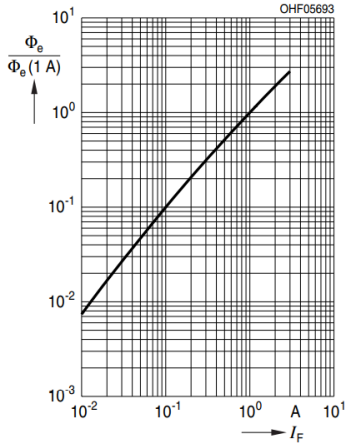
Forward current [7), 8)]

$I_F = f(V_F)$; single pulse; t_p = 100 µs



Relative Total Radiant Flux [7), 8)]

$\Phi_e/\Phi_e(1000mA) = f(I_F)$; single pulse; t_p = 100 µs



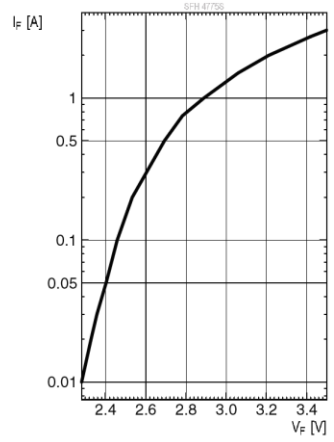
After PCN

Brightness Groups

Group	Total radiant flux [1)2)] I_F = 1000 mA; t_p = 10 ms min. Φ_e	Total radiant flux [1)2)] I_F = 1000 mA; t_p = 10 ms max. Φ_e
FA1	1120 mW	1250 mW
FA2	1250 mW	1400 mW
FB1	1400 mW	1600 mW

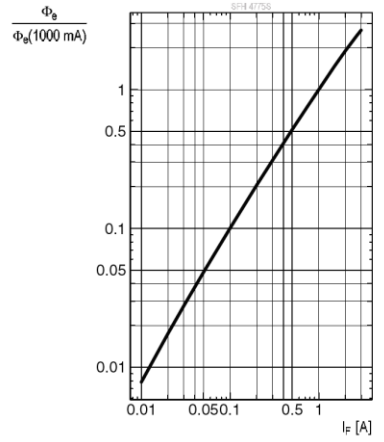
Forward current [7), 8)]

$I_F = f(V_F)$; single pulse; t_p = 100 µs



Relative Total Radiant Flux [7), 8)]

$\Phi_e/\Phi_e(1000mA) = f(I_F)$; single pulse; t_p = 100 µs



OS-PCN-2021-014-A
Introduction of next generation IR Thinfilm chip

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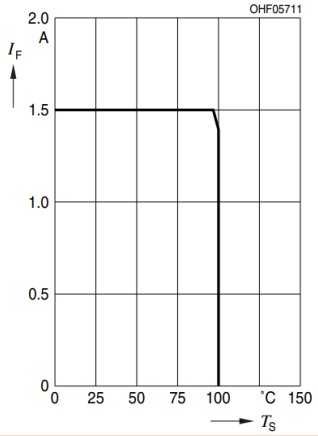
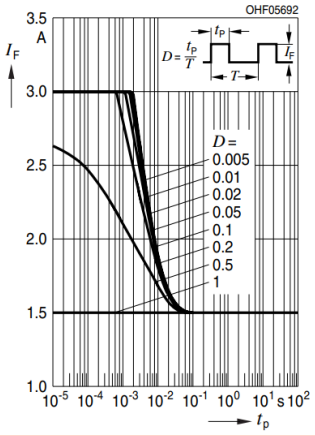
Changes in the datasheet

Before PCN	After PCN
Max. Permissible Forward Current $I_{F,max} = f(T_S)$; Rth_{js} = 9K / W  **Permissible Pulse Handling Capability** $I_F = f(t_p)$; D = parameter; T_S = 85°C  	Derating under verification

OS-PCN-2021-014-A
Introduction of next generation IR Thinfilm chip

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Time schedule for <u>PCN material</u> (after implementation of change):	Final qualification report	available
	Samples available	yes
	Intended Start of delivery	15.08.2021 *)

*) or earlier if released by customer and upon mutual agreement

Time schedule for <u>Pre-PCN material</u> (prior to implementation of change):	Last time order date (LTO)	31.07.2021 **)
	Last time delivery date (LTD)	31.10.2021 ***)

**) expected approval date needs to be available at this time. Lead time and LTO quantity shall be mutually agreed between OSRAM OS and customer.

***) 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.