

Light is OSRAM

01.09.2021

Dear Customer,

please find attached our OSRAM OS PCN:

OS-PCN-2021-020-A Introduction of Optimized Chip Generation for Package PLPT5 447KA

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 **07.10.2021**. *)

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-2021-020-A

Introduction of Optimized Chip Generation for Package PLPT5 447KA

Subject of change:	Introduction of Optimized Chip Generation for Package PLPT5 447KA	
Affected products	PLPT5 447KA	
Reason for change:	Introduction of optimized characteristics parameter and diagrams	
Description of change	Please refer to 2_cip_OS-PCN-2021-020-A	
Product identification:	Date code	
Time schedule for PCN material (after implementation of change):	Final datasheet	20.08.2021
	Final reliability report	24.08.2021
	Samples available	On request, November 2021
	Intended Start of delivery	February 2022*) *) or earlier if released by customer and upon mutual agreement
Assessment:	No changes in design or physical dimension No changes in reliability	
Documentation:	2_cip_OS-PCN-2021-020-A 3_cip_OS-PCN-2021-020-A_Reliability 4_cip_OS-PCN-2021-020-A_Datasheet	

Note:

PCN material: Products with implementation of the changes as described in the PCN.

Customer approval form

OS-PCN-2021-020-A

Introduction of Optimized Chip Generation for Package PLPT5 447KA

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

Please check the appropriate box below:

- | | |
|---|---|
| <input type="radio"/> Approval:
We agree with the proposed change and accept start of the shipment upon availability of PCN material. | <input type="radio"/> 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.

OSRAM Opto Semiconductors
GmbH

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Phone +49 941 850-5
Fax +49 941 850-1002
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OS-PCN-2021-020-A

**Introduction of Optimized Chip Generation
for Package PLPT5 447KA
Customer information package**

OS QM CQM | 01.09.2021

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Overview

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Introduction of Optimized Chip Generation for Package PLPT5 447KA



Reason for change

- Introduction of optimized characteristics parameter and diagrams

Assessment

- No changes in design or physical dimension
- No changes in reliability

OS-PCN-2021-020-A

Introduction of Optimized Chip Generation for Package PLPT5 447KA

QUALITY
FIRST

Affected products

- PLPT5 447KA Q65113A0154

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Introduction of Optimized Chip Generation for Package PLPT5 447KA



Changes in the datasheets: Up-dated Datasheet Version

Fill in if applicable, otherwise delete this slide

Product type	Data sheet version before PCN	Data sheet version after PCN
PLPT5 447KA	0.0	0.1 (= change of DS)

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.

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Introduction of Optimized Chip Generation for Package PLPT5 447KA



Changes in the datasheets

Status	Introduction of optimized characteristics parameter and diagrams
Current	<p>Features:</p> <ul style="list-style-type: none">— Typical emission wavelength: 447 nm
New	<p>Features:</p> <ul style="list-style-type: none">— Typical emission wavelength: 445 nm NEW

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Introduction of Optimized Chip Generation for Package PLPT5 447KA



Changes in the datasheets

Status	Introduction of optimized characteristics parameter and diagrams									
Current	<p>Maximum Ratings</p> <p>$T_c = 25\text{ }^\circ\text{C}$</p> <table border="1"><thead><tr><th>Parameter</th><th>Symbol</th><th>Values</th></tr></thead><tbody><tr><td>Operating current ¹⁾</td><td>I_{op} max.</td><td>1.5 A</td></tr></tbody></table>			Parameter	Symbol	Values	Operating current ¹⁾	I_{op} max.	1.5 A	
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Introduction of Optimized Chip Generation for Package PLPT5 447KA



Changes in the datasheets

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NEW

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Introduction of Optimized Chip Generation for Package PLPT5 447KA



Changes in the datasheets

Status	Introduction of optimized characteristics parameter and diagrams			
Current	<p>Relative Spectral Emission ^{5), 6)} $I_{e,rel} = f(\lambda); I_f = 1.2 \text{ A}; P_{opt} = 1.6 \text{ W}$</p>	<p>Optical Output Power ^{5), 6)} $P_{opt} = f(I_f)$</p>	<p>Opt. Power / Forward Voltage ^{5), 6)} $V_f = f(I_f)$</p>	<p>Threshold Current $I_{th} = f(T_c)$</p>
New	<p>Relative Spectral Emission $I_{e,rel} = f(\lambda); I_f = 0.9 \text{ A}; P_{opt} = 1.6 \text{ W}$</p>	<p>Optical Output Power ^{5), 6)} $P_{opt} = f(I_f)$</p>	<p>Opt. Power / Forward Voltage ^{5), 6)} $V_f = f(I_f)$</p>	<p>Threshold Current $I_{th} = f(T_c)$</p>

NEW

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Workability – Die Bond

Product	Die bond data																																						
PLPT5 447KA	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;">Die shear data</div> <table border="1"><thead><tr><th rowspan="2">Num.</th><th>LD</th><th>SM</th><th rowspan="2">Judge</th></tr><tr><th>>230g</th><th>>1300g</th></tr></thead><tbody><tr><td>1</td><td>593</td><td>2215</td><td>OK</td></tr><tr><td>2</td><td>368</td><td>2216</td><td>OK</td></tr><tr><td>3</td><td>541</td><td>2212</td><td>OK</td></tr><tr><td>4</td><td>479</td><td>2203</td><td>OK</td></tr></tbody></table> <table border="1"><thead><tr><th rowspan="2">Num.</th><th>ZD</th><th rowspan="2">Judge</th></tr><tr><th>>35g</th></tr></thead><tbody><tr><td>1</td><td>130</td><td>OK</td></tr><tr><td>2</td><td>124</td><td>OK</td></tr><tr><td>3</td><td>129</td><td>OK</td></tr><tr><td>4</td><td>139</td><td>OK</td></tr></tbody></table> <p>※Die shear spec. according to MIL STD.</p>	Num.	LD	SM	Judge	>230g	>1300g	1	593	2215	OK	2	368	2216	OK	3	541	2212	OK	4	479	2203	OK	Num.	ZD	Judge	>35g	1	130	OK	2	124	OK	3	129	OK	4	139	OK
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<u>Conclusion:</u>	Die bond workability data pass the process assembly requirements.																																						

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Introduction of Optimized Chip Generation for Package PLPT5 447KA

Workability – Wire Bond

Product	Wire Bond Workability																		
PLPT5 447KA	Wire pulling strength																		
	Wire Pull (Spec : ≥4g)																		
	Num.	#1	mode	#2	mode	#3	mode	#3	mode	#4	mode	#5	mode	#6	mode	#7	mode	#8	mode
	1	9.5	B	9.6	B	9.5	B	9.7	B	8.0	B	8.1	B	7.9	B	7.2	B	8.8	B
	2	9.4	B	8.8	B	8.7	B	8.1	B	8.5	B	8.7	B	7.9	B	7.7	B	9.2	B
	3	9.0	B	9.6	B	9.1	B	9.7	B	7.9	B	8.4	B	8.1	B	8.0	B	8.1	B
	4	9.8	B	9.9	B	9.8	B	9.3	B	8.3	B	7.5	B	7.9	B	8.7	B	8.5	B
	AVG	9.4		9.5		9.3		9.2		8.2		8.2		8.0		7.9		8.7	
	max	9.8	OK	9.9	OK	9.8	OK	9.7	OK	8.5	OK	8.7	OK	8.1	OK	8.7	OK	9.2	OK
	min	9.0		8.8		8.7		8.1		7.9		7.5		7.9		7.2		8.1	
	max-min	0.8		1.1		1.1		1.6		0.6		1.2		0.2		1.5		1.1	
	Ball shearing strength																		
	Ball Shear (Spec : ≥25g)																		
	Num.	#1	mode	#2	mode	#3	mode	#3	mode	#4	mode	#5	mode	#6	mode	#7	mode	#8	mode
	1	25.9	B	36.9	B	39.9	B	37.3	B	36.3	B	40.4	B	34.0	B	46.2	B	40.9	B
	2	26.4	B	40.4	B	36.2	B	34.4	B	39.2	B	40.9	B	44.8	B	39.7	B	43.8	B
	3	26.0	B	31.5	B	36.5	B	28.6	B	36.5	B	39.2	B	40.2	B	29.3	B	25.5	B
	4	25.7	B	32.1	B	38.3	B	36.2	B	38.9	B	45.2	B	37.6	B	44.6	B	40.3	B
	Avg	26.0		35.2		37.7		34.1		37.7		41.4		39.2		40.0		49.0	
	max	26.4	OK	40.4	OK	39.9	OK	37.3	OK	39.2	OK	45.2	OK	44.8	OK	46.2	OK	43.8	OK
	min	25.7		31.5		36.2		28.6		36.3		39.2		34.0		29.3		25.5	
	max-min	0.7		8.9		3.7		8.7		2.9		6.0		10.8		16.9		18.3	
	<u>Conclusion:</u>	Wire bond workability data pass the process assembly requirements.																	

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Introduction of Optimized Chip Generation for Package PLPT5 447KA



Workability – Hermeticity

Product	Hermeticity Workability									
PLPT5 447KA	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin-bottom: 10px;">Leakage test</div> <table border="1"><thead><tr><th>Hermeticity test</th><th>NG Rate/Quantity</th><th>Remark</th></tr></thead><tbody><tr><td>Fine leak < 5.0E-09 Pa*m3/sec</td><td>0/376</td><td>2.35E-09 Pa*m3/sec</td></tr><tr><td>Gross leak No Bubble</td><td>0/10</td><td>No Bubble</td></tr></tbody></table>	Hermeticity test	NG Rate/Quantity	Remark	Fine leak < 5.0E-09 Pa*m3/sec	0/376	2.35E-09 Pa*m3/sec	Gross leak No Bubble	0/10	No Bubble
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Gross leak No Bubble	0/10	No Bubble								
<u>Conclusion:</u>	Hermeticity workability data pass the process assembly requirements.									

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Introduction of Optimized Chip Generation for Package PLPT5 447KA



Reliability test plan

Test vehicle: PLPT5 477KA

Test item	Test condition	Test duration	Sample Size
High Temperature Operating Life HTOL <i>JESD22-A108</i>	$T_A = 50^{\circ}\text{C}$, $I_{\text{const}} = 1\text{A}$; $P_{\text{opt}} = 1,6\text{W}$	1000h	2×10^1
Wet High Temperature Storage WHTS <i>JESD22-A101</i>	$T_A = 85^{\circ}\text{C}$, r.H = 85%	1000h	2×10^2
Vibration Variable Frequency VVF <i>JESD22-B103</i>	20g; 20 – 2000Hz; 4min / cycle; 4 cycles / axis	1x	2×5^2
Mechanical shock MS <i>JESD22-B110</i>	1500g; 5 blows X12, Y12, Z12	1x	2×5^2

Note: 1) Optimized chip generation acc. to OS-PCN-2021-020-A
2) Generic data from PLTB450B2

Failure criteria:

Optical failures: $P_{\text{opt}} (@1.2\text{A}) > \pm 30\%$ from initial value

Electric failure: $V_f (@ 1.2\text{A}) > 6.0\text{V}$

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Introduction of Optimized Chip Generation for Package PLPT5 447KA



PCN samples

PCN Samples Availability

On request, November 2021

OS-PCN-2021-020-A

Introduction of Optimized Chip Generation for Package PLPT5 447KA



Time schedule for PCN material
(after implementation
of change):

Final datasheet	20.08.2021
Final reliability report	24.08.2021
Samples available	On request, November 2021
Intended Start of delivery	February 2022 ^{*)}

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

QUALITY
FIRST

Thank you.