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OSRAM OS GmbH

PCN Advance Notice 02/2016

OSRAM OS | August 2016 | Regensburg

Light is **OSRAM**

OSRAM
Opto Semiconductors

Disclaimer



The information contained in this presentation is intended to inform our customers upfront about upcoming important product/process changes. The time frame for the implementation is approximately 1 year. This document will not substitute the OSRAM OS official PCN procedure and documentation and has not the entitlement to list all upcoming changes within one year.

Your feedback which additional information is required from your side is highly appreciated but please be informed that part of this information might not be available before the PCN.

For your feedback and any questions in this respect please contact your responsible account manager.

Unauthorized disclosure of the document content is strictly prohibited.

Please feedback sample requirement at earliest.

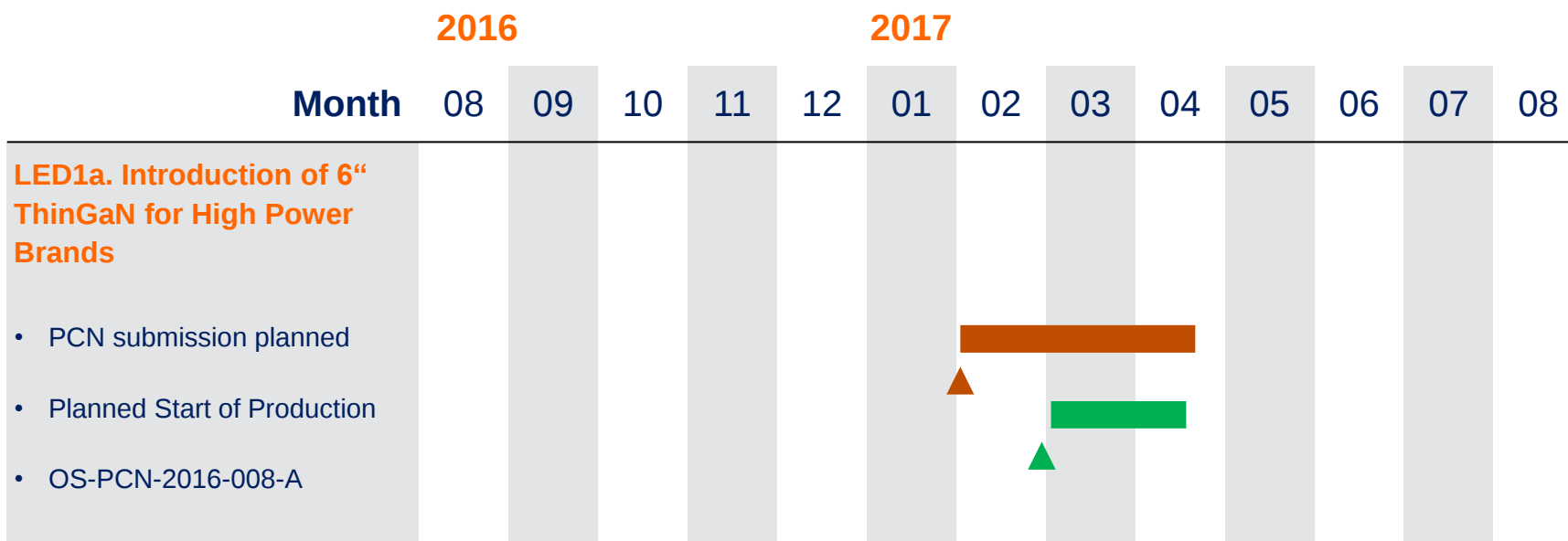
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LED1a. Introduction of 6" ThinGaN for High Power Brands

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Affected Brands:

Golden DRAGON

OSLON Black

LED1a. Introduction of 6“ ThinGaN for High Power Brands

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Motivation and Impact:

- Secure continuous supply – lower risk of allocation
 - Increase automotive capacity – growing market demand
 - In order to increase the capacity for the ThinGaN Chip Family and to achieve a homogeneity within the Production the wafer size will be changed to 6” based on Si Carrier
 - Full conversion to 6” is planned (discontinuation of 4”) – parallel production for a certain period.
-
- no change of fit/form/function of product; improved thermal characteristics
 - OS-PCN-2016-008-A

LED1a. Introduction of 6“ ThinGaN for High Power Brands

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Change Matrix:

	Golden Dragon	OSLON Black
6“ ThinGaN a) Si carrier b) Vf spec c) Rth	X	X
Plasma chip dicing	X	X

LED1a. Introduction of 6“ ThinGaN for High Power Brands

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Device list:

Golden Dragon	OSLON Black
LB W5SM	LCW H9GP
LCW W5SM	LUW H9GP
LCY W5SM	LUW H9GP.CE
LD W5SM	
LUW W5SM	
LW W5SM	

LED1a. Introduction of 6“ ThinGaN for High Power Brands

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Time Schedule:

PCN planned for	February 2017
Final qualification report	February 2017
Samples	February 2017
Production release	March 2017

LTO: September 2017

LED1b. Introduction of 6" ThinGaN for Mid and Low Power Brands

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Affected Brands:

Advanced Power TOPLED	Advanced Power TOPLED Plus	OSLON SX		
Multi CHIPLED	PointLED	Micro SIDELED	Mini TOPLED	SIDELED
DISPLIX	Power TOPLED	MULTILED	TOPLED	

LED1b. Introduction of 6“ ThinGaN for Mid and Low Power Brands

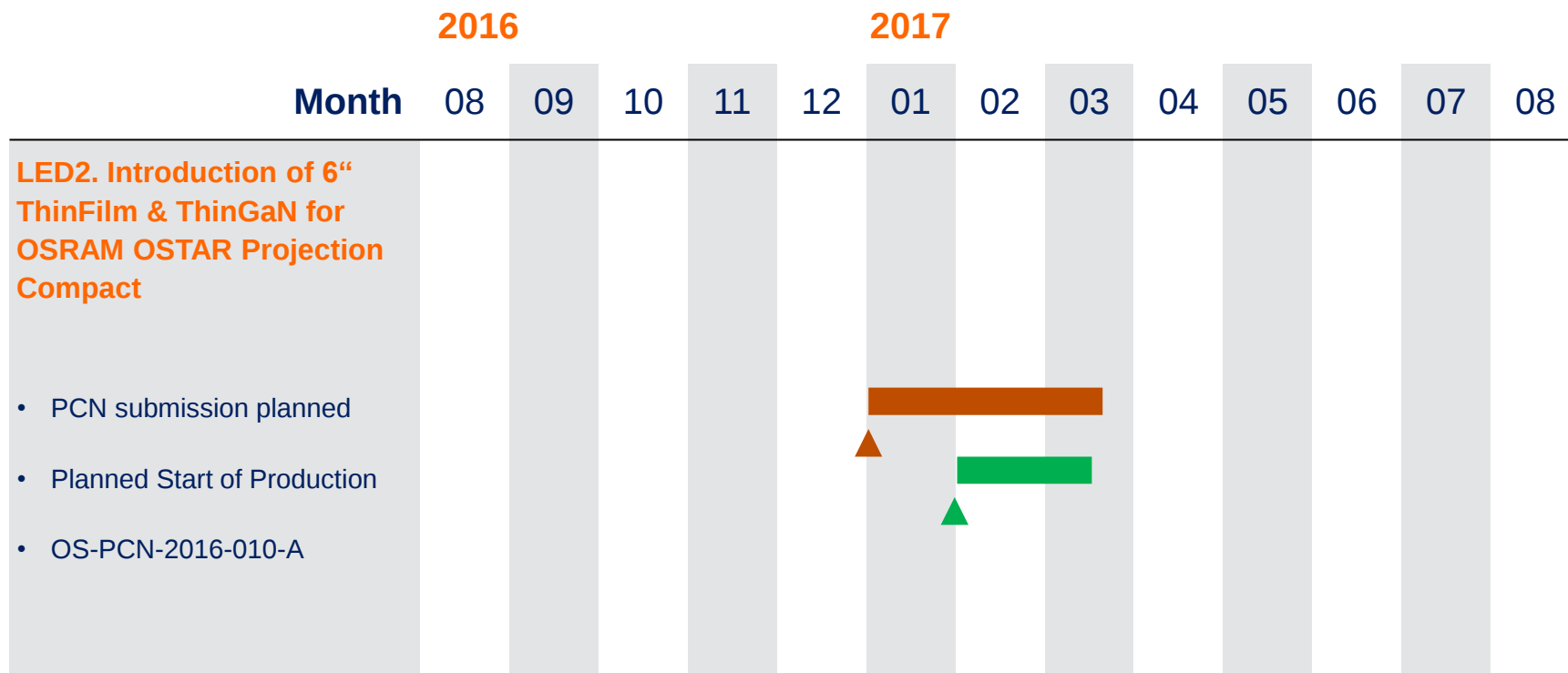
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Motivation and Impact:

- Increase automotive capacity – growing market demand
- In order to increase the capacity for the ThinGaN Chip Family and to achieve a homogeneity within the Production the wafer size will be changed to 6” based on Si Carrier
- Full conversion to 6” is planned (discontinuation of 4”) – parallel production for a certain period.
- PCN publication will be started in Q3/Q4 2017

LED2. Introduction of 6" ThinFilm & ThinGaN for OSRAM OSTAR Projection Compact

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Affected Brands:

OSRAM OSTAR Projection Compact

LED2. Introduction of 6“ ThinFilm & ThinGaN for OSRAM OSTAR Projection Compact

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Motivation and Impact:

- In order to increase the capacity for the ThinGaN Chip and ThinFilm Chip Family and to achieve a homogeneity within the Production the wafer size will be changed to 6” based on Si Carrier
- Full conversion to 6” is planned (discontinuation of 4”) – parallel production for a certain period.
- no change of fit/form/function of product; improved thermal characteristics
- OS-PCN-2016-010-A

LED2. Introduction of 6" ThinFilm & ThinGaN for OSRAM OSTAR Projection Compact

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Change Matrix and affected Products:

	LE A Q9WM	LE A Q9WN	LE B Q9WN
6" InGaAlP a) Si carrier b) Vf spec c) Rth	X	X	
6" ThinGaN a) Si carrier b) Vf spec c) Rth			X

LED2. Introduction of 6“ ThinFilm & ThinGaN for OSRAM OSTAR Projection Compact

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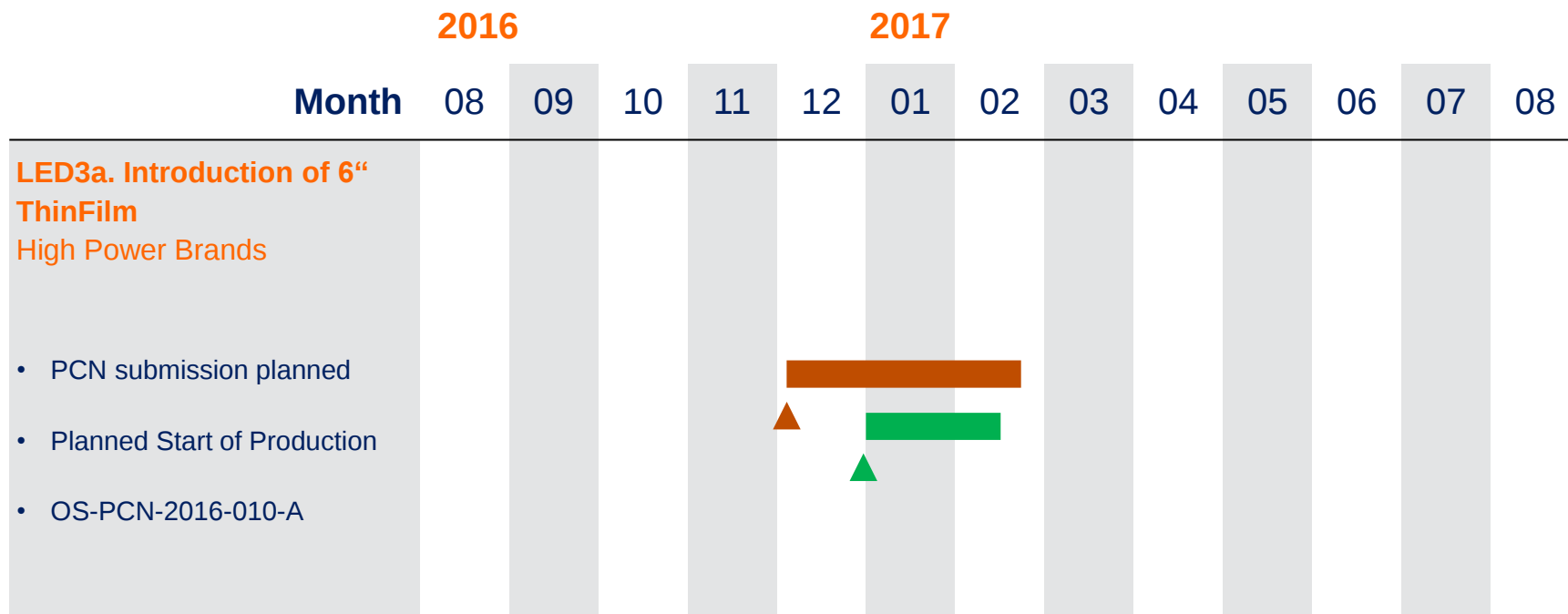
Time Schedule:

PCN planned for	January 2017
Final qualification report	January 2017
Samples	January 2017
Production release	February 2017

LTO: August 2017

LED3a. Introduction of 6“ ThinFilm High Power Brands

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Affected Brands:

Golden DRAGON	OSLON Black Flat *)	Platinum Dragon
OSLON Black	OSLON Signal	Synios P2720

*) Update whether affected may be published in September

LED3a. Introduction of 6“ ThinFilm

High Power Brands



Motivation and Impact:

- Secure continuous supply – lower risk of allocation
- Increase automotive capacity – growing market demand
- In order to increase the capacity for the ThinFilm Chip Family and to achieve a homogeneity within the Production the wafer size will be changed to 6” based on Si Carrier
- Full conversion to 6” is planned (discontinuation of 4”) – parallel production for a certain period.
- no change of fit/form/function of product; improved thermal characteristics
- OS-PCN-2016-010-A

LED3a. Introduction of 6“ ThinFilm High Power Brands

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Description of change

	Old – Ge carrier	New – Si carrier
1mm ²		
750μm		
Chip height	190μm	120μm



LED3a. Introduction of 6“ ThinFilm High Power Brands

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Device List:

Golden Dragon	OSLON Black Flat *)	OSLON Black	Platinum Dragon	OSLON Signal	Synios P2720
LA W5SM	LR H9PP *)	LA H9GP	LA W5SN	LJ CKBP	KS DMLS31.23
LR W5SM	LS H9PP *)	LR H9GP	LR W5SN	LY CKBP	KS DMLQ31.23
LY W5SM	LY H9PP *)	LY H9GP	LYW5SN		KR DMLS31.23
	LA H9PP *)				KR DMLQ31.23
					KY DMLQ31.23
					KY DMLS31.23

*) Update whether affected may be published in September

LED3a. Introduction of 6“ ThinFilm High Power Brands

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Time Schedule:

PCN planned for	December 2016
Final qualification report	December 2016
Samples	December 2016
Production release	January 2017

LTO: August 2017

LED3b. Introduction of 6" ThinFilm Low/MidPower Brands

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Affected Brands:

Advanced Power TOPLED	PointLED	Multi TOPLED	SYNIOS P2720	Mini TOPLED	Advanced Power TOPLED Plus	Micro SIDELED
DISPLIX	Power SIDELED	MULTILED	TOPLED	SIDELED	OSLON SX	Power TOPLED

LED3b. Introduction of 6“ ThinFilm

Low/MidPower Brands

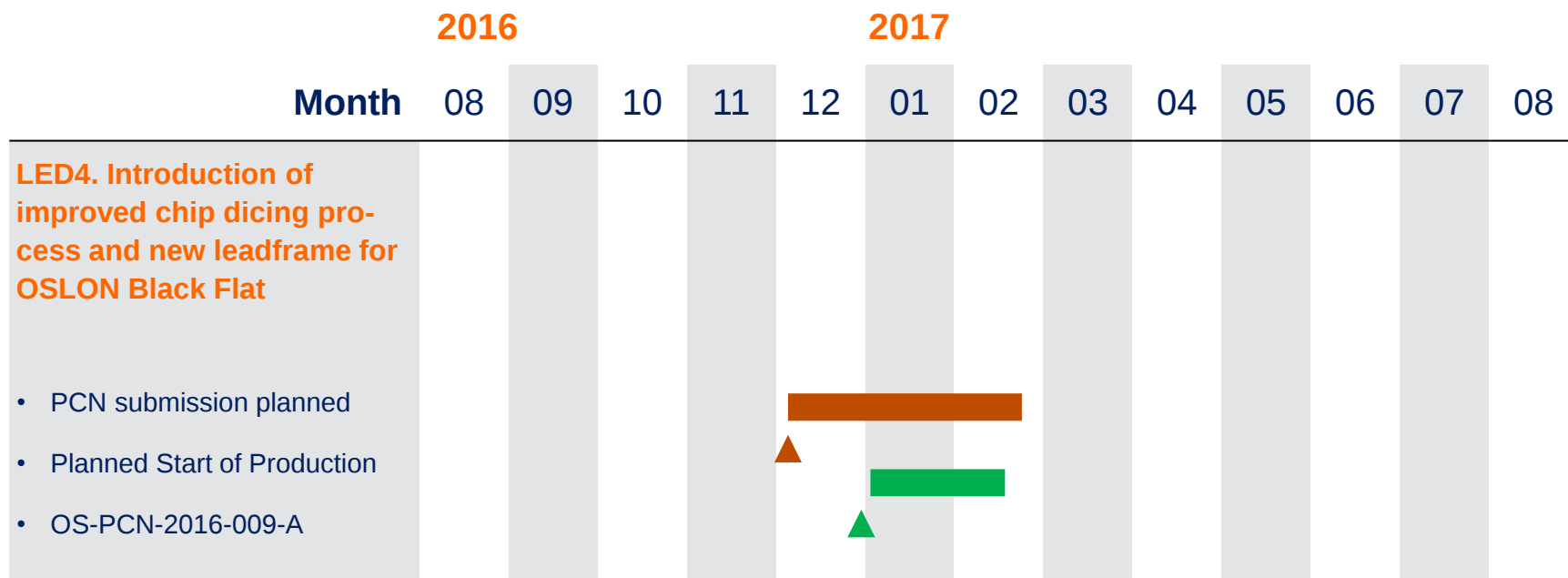


Motivation and Impact:

- In order to increase the capacity for the ThinFilm Chip Family and to achieve a homogeneity within the Production the wafer size will be changed to 6” based on Si Carrier
 - For 300µm and 500µm chip size ThinFilm only conversion from Ge-carrier to Si-carrier applies since change from 4” to 6” wafer size was covered by OS-PCN-2013-023-A
 - Full conversion to 6” is planned (discontinuation of 4”) – parallel production for a certain period. Therefore release of 4” and 6” is necessary.
-
- PCN publication will be started in Q4/2017

LED4. Introduction of improved chip dicing process and new leadframe for OSRON Black Flat

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Affected Brands:

OSRON Black Flat

LED4. Introduction of improved chip dicing process and new leadframe for OSLON Black Flat

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Motivation and Impact:

- reason: to ensure future customer demands
- no change of fit/form/function of product; improved thermal characteristics
- OS-PCN-2016-009-A

LED4. Introduction of improved chip dicing process and new leadframe for OSOLON Black Flat

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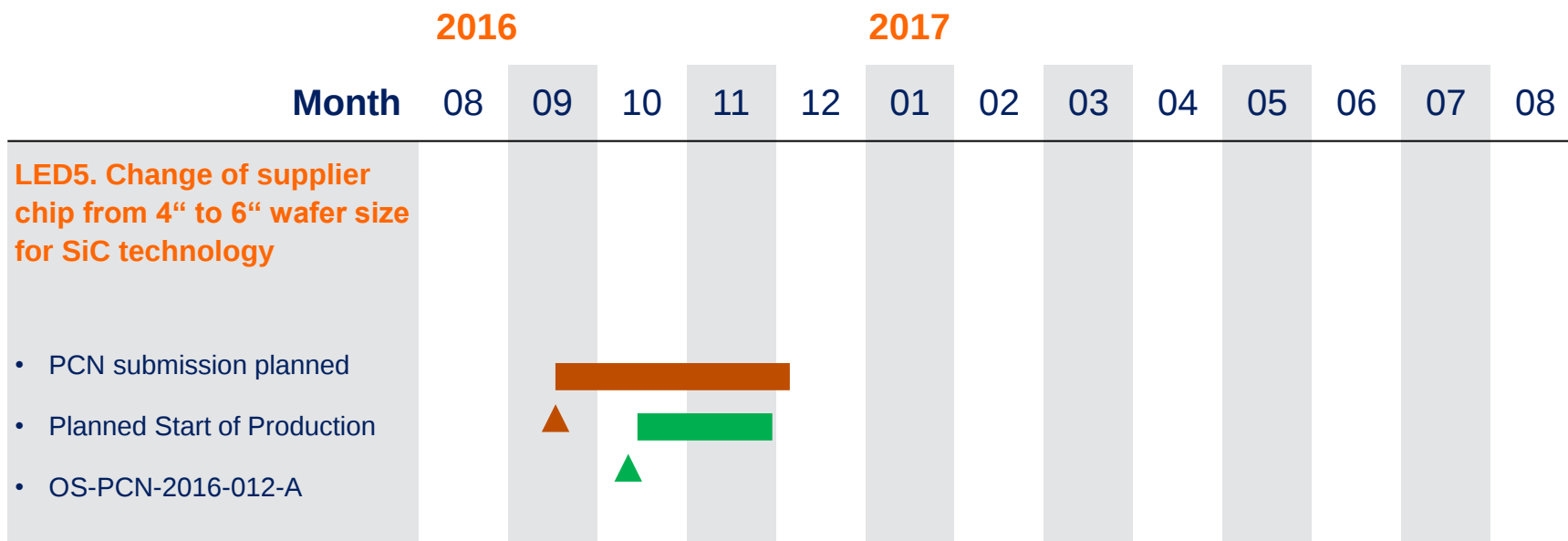
Time Schedule:

PCN planned for	December 2016
Final qualification report	December 2016
Samples	December 2016
Production release	January 2017

LTO: July 2017

LED5. Change of supplier chip from 4" to 6" wafer size for SiC technology

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Affected Brands:

SMARTLED 0603	PointLED	Power TOPLED Lens	Micro SIDELED	TOPLED
Mini TOPLED	Power TOPLED	SIDELED		

LED5. Change of supplier chip from 4“ to 6“ wafer size

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Motivation and Impact:

- Secure continuous supply – lower risk of allocation
 - Full conversion to 6” is planned (discontinuation of 4”) – parallel production for a certain period. Therefore release of 4” and 6” is necessary.
- Device types: Lx xxx3 / Lx xxxS / Lx xxxC
- OS-PCN-2016-012-A
 - Preliminary PCN is available

LED5. Change of supplier chip from 4" to 6" wafer size

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Description of change:

- Introduction of 6" SiC chip for low power InGaN product portfolio
- Introduction of Vf-binning for selected Mini TOPLED / PointLED / SIDELED / TOPLED devices
- No change of production location
- No change in fit / form / function or reliability.
- LEDs with chips from 4" and 6" wafer production are mixable.

LED5. Change of supplier chip from 4" to 6" wafer size

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Device List:

TOPLED	Power TOPLED	Power TOPLED Lens	Mini TOPLED	PointLED	SMARTLED 0603	SIDELED	Micro SIDELED
LB T673	LB E67C	LB E63C	LB M673	LCB P473	LB L293	LB A673	LT Y87S
LB T67C	LCP E6SC	LT E63C	LCB M67C	LW P473	LT L29S	LB A67C	LW Y87C
LCB T67S	LT E67C		LCB M67S		LW L283	LT A673	
LT T673	LW E67C		LCG M67S			LT A67C	
LT T67C	LW E6SC		LCL M67S			LW A673	
LW T673			LT M673			LW A67C	
LW T67C			LW M673				
LW T6SC			LW M67C				
LW T773			SFH 4224				

LED5. Change of supplier chip from 4“ to 6“ wafer size

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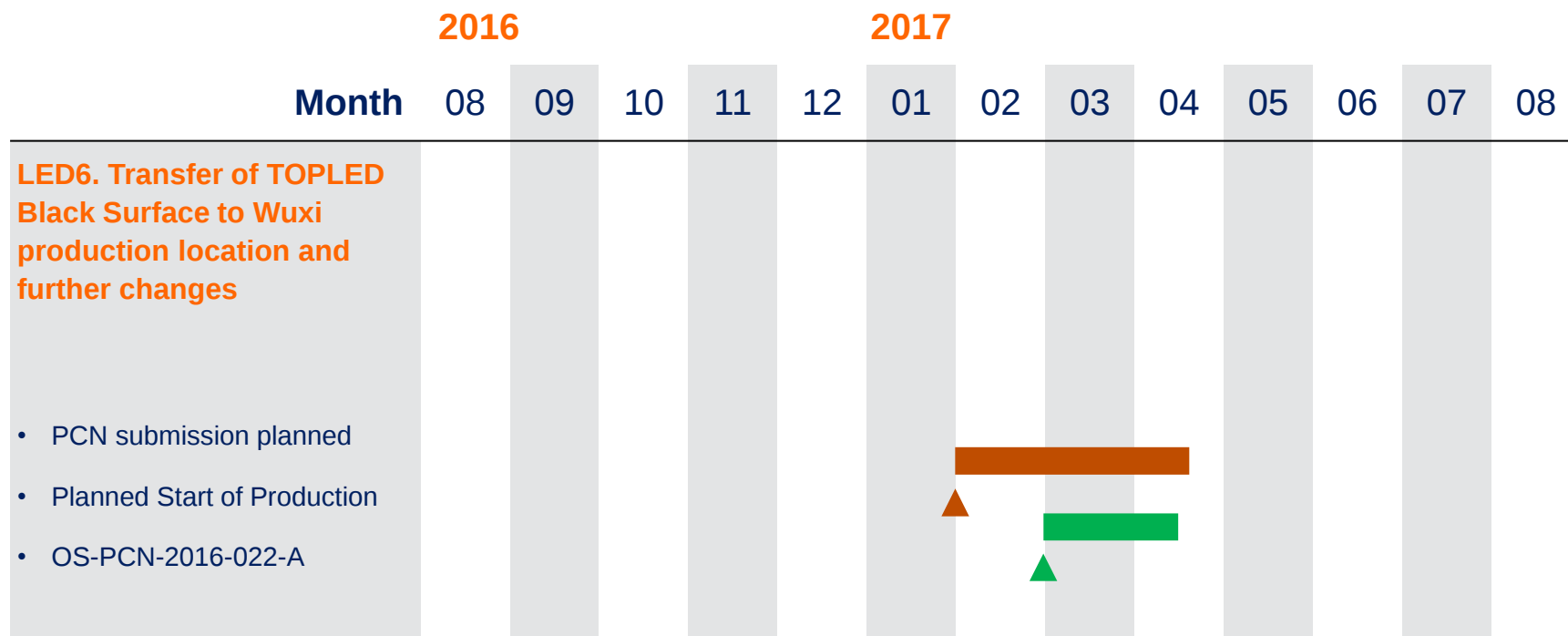
Time Schedule:

PCN planned for	Mid September 2016
Final qualification report	October 2016
Samples	Mid September 2016
Production release	October 2016

LTO: 15.04.2017

LED6. Transfer of TOPLED Black Surface to Wuxi production location and further changes

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Affected Brands:

TOPLED Black Surface

LED6. Transfer of TOPLED Black Surface to Wuxi production location and further changes



Motivation and Impact:

- to ensure future customer demands and increase productivity
- OS-PCN-2016-022-A

LED6. Transfer of TOPLED Black Surface to Wuxi production location and further changes

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Device List:

TOPLED Black Surface	Plating	Wire	Laser Mark	Wuxi
LA T68B			X	X
LR T68F	X	X	X	X
LY T686	X	X	X	X
LY T68B			X	X
LY T68F	X	X	X	X

LED6. Transfer of TOPLED Black Surface to Wuxi production location and further changes



Time Schedule:

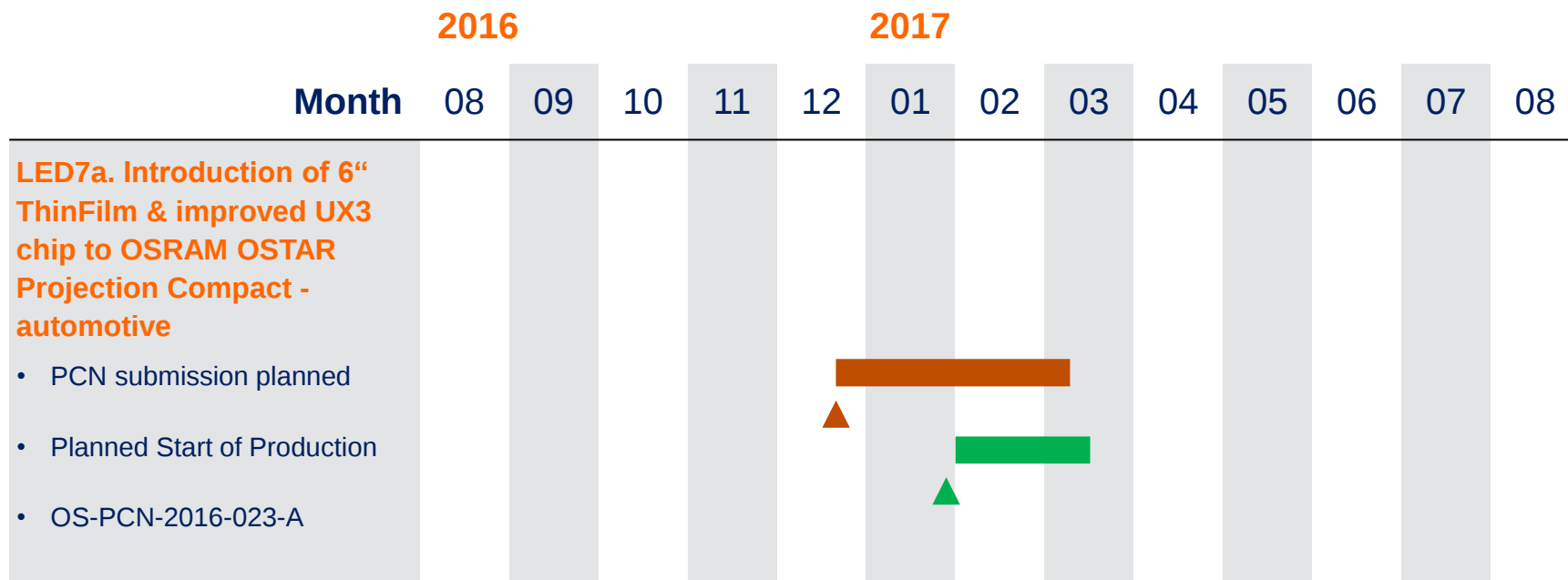
PCN planned for	February 2017
Final qualification report	February 2017
Samples	February 2017
Production release	March 2017

LTO: August 2017

LED7a. Introduction of 6" ThinFilm & improved UX3 chip to OSRAM OSTAR Projection Compact - automotive

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Affected Brands:

OSRAM OSTAR
Projection Compact

LED7a. Introduction of 6" ThinFilm & improved UX3 chip to OSRAM OSTAR Projection Compact - automotive

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Motivation and Impact:

- Increase automotive capacity – growing market demand
- Secure continuous supply – lower risk of allocation
- Full conversion to 6" (ThinFilm) is planned (discontinuation of 4") – parallel production for a certain period. Therefore release of 4" and 6" is necessary
- no change of form/function of product
- improved thermal characteristics (ThinFilm)
- OS-PCN-2016-023-A

LED7a. Introduction of 6" ThinFilm & improved UX3 chip to OSRAM OSTAR Projection Compact - automotive

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Change Matrix:

	OSRAM OSTAR Projection compact
6" ThinFilm a) Si carrier b) Vf spec c) Rth	X
Improved UX3 chip a.) improved Via design b.) reduced Vf_max	X

LED7a. Introduction of 6“ ThinFilm & improved UX3 chip to OSRAM OSTAR Projection Compact - automotive

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Device list:

OSRAM OSTAR Projection compact
LE A Q8WP
LE B Q8WP
LE CG Q8WP
LE A Q7WP
LE B Q7WP
LE CG Q7WP

LED7a. Introduction of 6“ ThinFilm & improved UX3 chip to OSRAM OSTAR Projection Compact - automotive

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Time Schedule:

PCN planned for	December 2016
Final qualification report	December 2016
Samples	December 2016
Production release	February 2017

LTO: July 2017

LED7b. Introduction of improved UX3 chip to OSRAM OSTAR Projection and OSTAR Stage

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Affected Brands:

OSRAM OSTAR
Projection Compact

OSRAM OSTAR
Projection Power

OSRAM OSTAR
Stage

LED7b. Introduction of improved UX3 chip to OSRAM OSTAR Projection and OSTAR Stage

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Motivation and Impact:

- Increase automotive capacity – growing market demand
- Secure continuous supply – lower risk of allocation
- no change of fit/form/function of product
- OS-PCN-2016-024-A

LED7b. Introduction of improved UX3 chip to OSRAM OSTAR Projection and OSTAR Stage

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Change Matrix:

	OSRAM OSTAR Projection compact
6" ThinFilm a) Si carrier b) Vf spec c) Rth	X
Improved UX3 chip a.) improved Via design b.) reduced Vf_max	X

LED7b. Introduction of improved UX3 chip to OSRAM OSTAR Projection and OSTAR Stage

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Device list:

OSRAM OSTAR Projection compact	OSRAM OSTAR Projection Power	OSRAM OSTAR Stage
LE B Q8WP	LE B P1W	LE RTDUW S2WP
LE CG Q8WP	LE CG P1A	
LE UW Q8WP	LE CG P1W	
LE B Q7WP	LE B P2W	
LE CG Q7WP	LE B P2W 01	
	LE CG P2A	
	LE CG P2A 01	
	LE CG P2W	
	LE CG P2W 01	
	LE B P3W 01	

LED7b. Introduction of improved UX3 chip to OSRAM OSTAR Projection and OSTAR Stage

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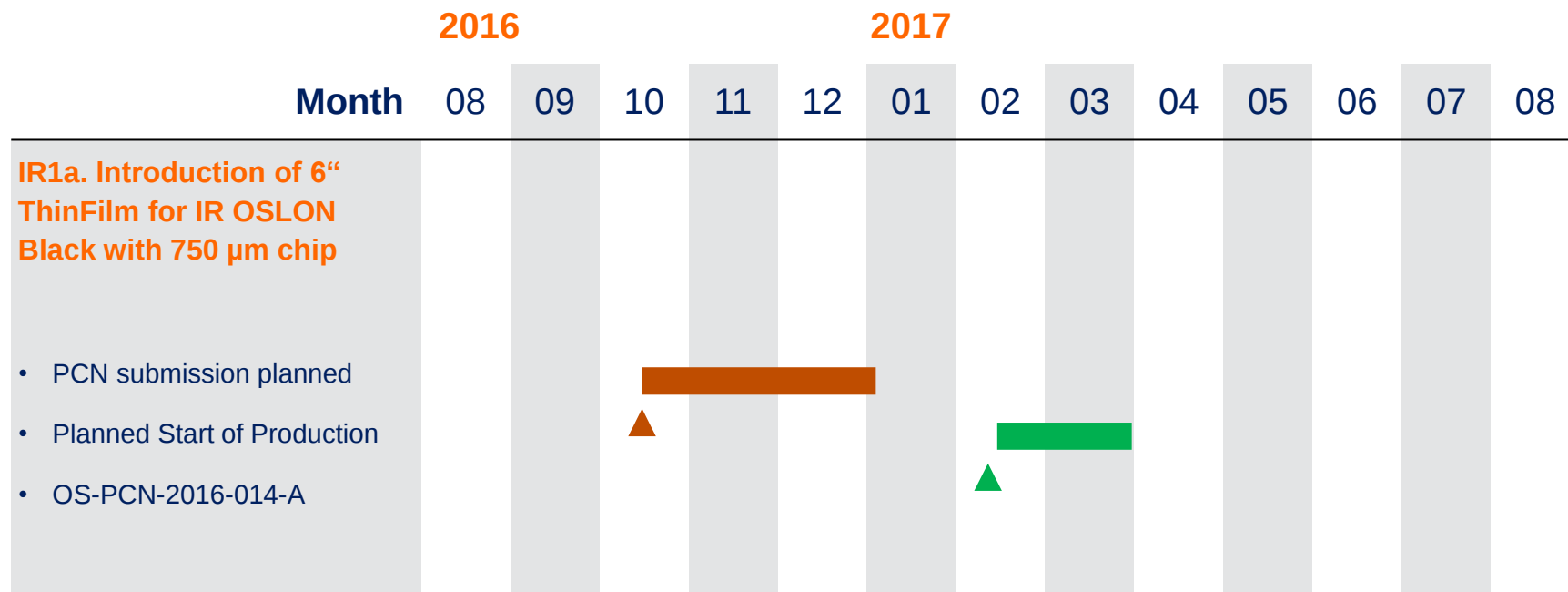
Time Schedule:

PCN planned for	December 2016
Final qualification report	December 2016
Samples	December 2016
Production release	February 2017

LTO: July 2017

IR1a. Introduction of 6" ThinFilm for IR OSLON Black with 750 μm chip

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Affected Brands & Devices:

OSLON Black
SFH 4713A
SFH 4714A

IR1a. Introduction of 6" ThinFilm for IR OSLO[®] Black with 750 μm chip

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Motivation and Impact:

- to ensure future customer demands
- Improvement of thermal characteristics due to change from Ge-carrier to Si-carrier and reduction of chip thickness by $\sim 30\mu\text{m}$.
- no change of fit/form/function of product; improved thermal characteristics
- OS-PCN-2016-014-A

IR1a. Introduction of 6“ ThinFilm for IR OSLO^N Black with 750 µm chip

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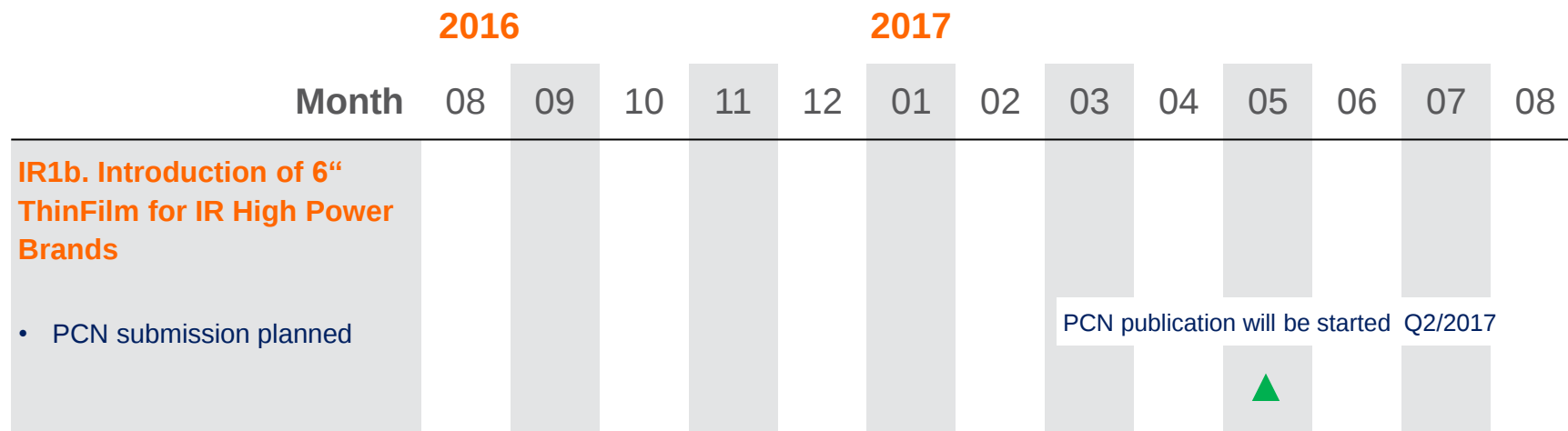
Time Schedule:

PCN planned for	Mid October 2016
Final qualification report	Mid October 2016
Samples	Mid October 2016
Production release	February 2017

LTO: 15.09.2017

IR1b. Introduction of 6" ThinFilm for IR High Power Brands

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Affected Brands:

OSLON Black
(1 mm² chip)

OSLUX

SYNOS P2720

Golden DRAGON

DRAGON Dome

IR1b. Introduction of 6“ ThinFilm for IR High Power Brands

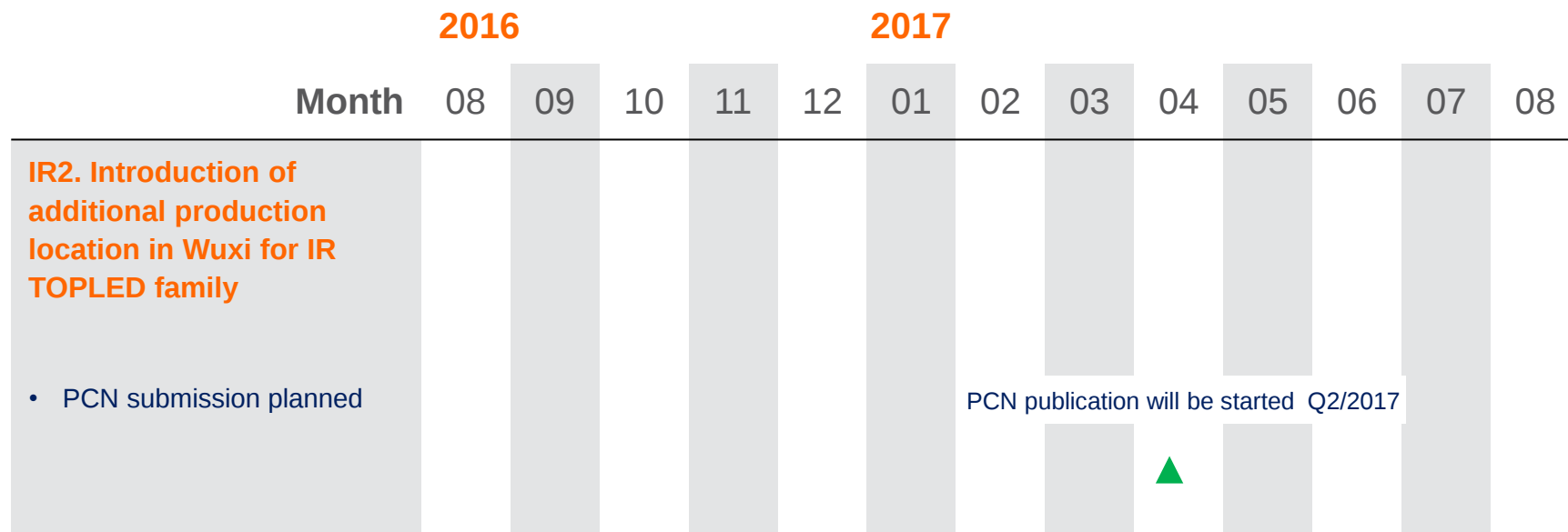
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Motivation and Impact:

- to ensure future customer demands
- Improvement of thermal characteristics due to change from Ge-carrier to Si-carrier and reduction of chip thickness by $\sim 30\mu\text{m}$.
- no change of fit/form/function of product; improved thermal characteristics
- PCN publication planned for Q2/2017

IR2. Introduction of additional production location in Wuxi for IR TOPLED family

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Affected Brands:

TOPLED	TOPLED Lens	Power TOPLED	Power TOPLED Lens	Multi TOPLED
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IR2. Introduction of additional production location in Wuxi for IR TOPLED family

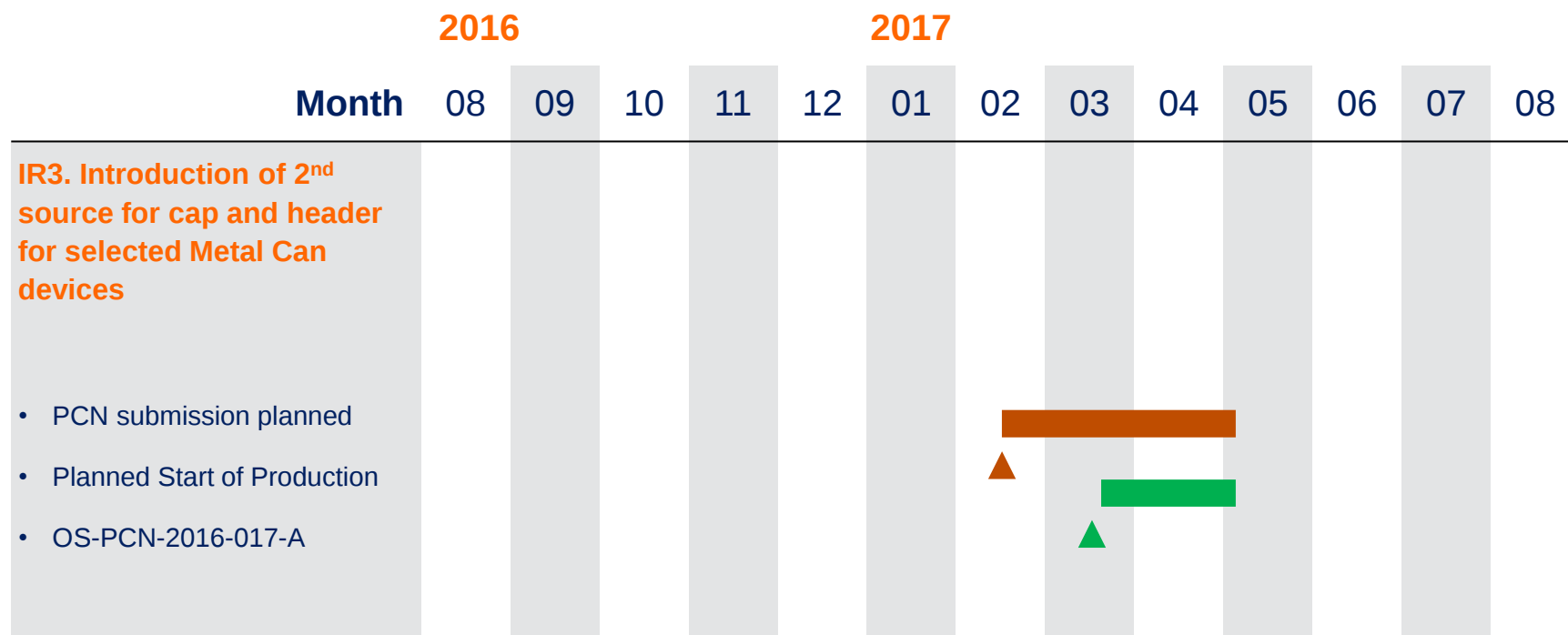
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Motivation and Impact:

- to ensure future customer demands
- no change of fit/form/function of product
- PCN publication planned for Q2/2017

IR3. Introduction of 2nd source for cap and header for selected Metal Can devices

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Affected Brands & Devices:

Metal Can
BPX 38
BPX 43
BPY 62
SFH 221

IR3. Introduction of 2nd source for cap and header for selected Metal Can devices

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Motivation and Impact:

- to ensure future customer demands
- no change of fit/form/function of product
- OS-PCN-2016-017-A

IR3. Introduction of 2nd source for cap and header for selected Metal Can devices

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Time Schedule:

PCN planned for	Mid February 2017
Final qualification report	Mid February 2017
Samples	Mid February 2017
Production release	March 2017

LTO: 15.09.2017

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Thank you.