

Recommended pick and place tools for LEDs from OSRAM Opto Semiconductors

Application Note



Valid for:
all SMT products

Abstract

OSRAM Opto Semiconductors SMT devices are developed for assembly by automatic placement machines. To achieve a damage-free processing of LEDs, appropriate and individual pick and place tools (the nozzles) must be used.

The following pages provide information about important parameters that should be considered for LED assembly. Furthermore a recommended nozzle design for each LED in the OSRAM Opto Semiconductors portfolio is given.

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A. Pick and place process

As is the standard for SMD devices, all SMD LEDs from OSRAM OS are designed for an automated pick and place process. To receive optimal process results, it is necessary to set the pick and place machine properly.

In the initial production run, it must be ensured that the LED package can be grabbed by the nozzle and sucked out of the tape pocket. Therefore an appropriate nozzle (pipette or pick-up tool) has to be used. This application guide gives an overview of the recommended nozzles and the dimensions. An appropriate nozzle not only ensures a good pick and place process, it also helps to prevent damage to the LED.

To avoid any damage during the pick-up process, the pick-up position should be controlled and adjusted during the set-up. All other pick and place process parameters should also be adjusted. The default settings of the machine are a good starting point. The placement force, for example, can be tested with 2.0 N at the beginning, but it should be less than 2.0 N if possible.

B. Overview of recommended nozzle designs

For the processing of LEDs it must be ensured that the process parameters are conform to the package characteristics during assembly.

If nozzles or nozzle designs other than the recommendations are used, it must be strictly observed that especially the critical and optical relevant area (area over die/s and wire bond/s) is not loaded.

If further information or support regarding the processing of LEDs is needed please contact OSRAM Opto Semiconductors.

A catalog with a linkage of the tools to the associated LED product family is listed in Table 1. This table shows each LED product family and the recommended nozzle design with the nozzle number and a dimension drawing of the nozzle. Alternative nozzles are indicated for some products. Since most products were

tested with SIPLACE pick and place machines, SIPLACE nozzles are often recommended. If other types of pick and place machines are used in the field, please use modified tools according to the given dimensions and body structure for the mounting.

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


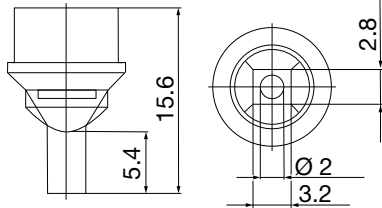

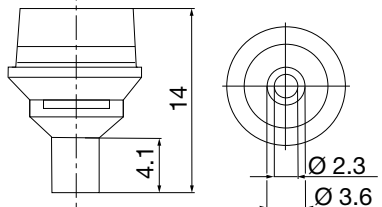

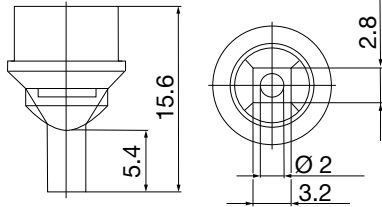

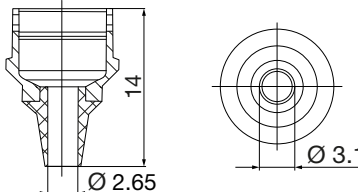

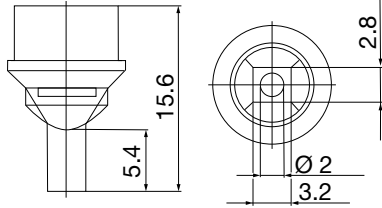
Product family	Recommended nozzle design		
Advanced Power TOPLED Lx G6xP		SIPLACE 03055425	
Advanced Power TOPLED Plus Lx G5xP / Lxx G5xP		SIPLACE 03066826	
Power TOPLED Lx E67x SFH 4250 / SFH 4240 / SFH 331 / SFH 7225 / SFH7250 / SFH 7251 / SFH 7252		SIPLACE 03055425	
Power TOPLED Lens Lx E63x SFH 4258 / SFH 4259 / SFH 4248 / SFH 4249		SIPLACE 03054261	
TOPLED Lx T67x / Lx T678x SFH 4053 SFH 4243 SFH 4257		SIPLACE 03055425	

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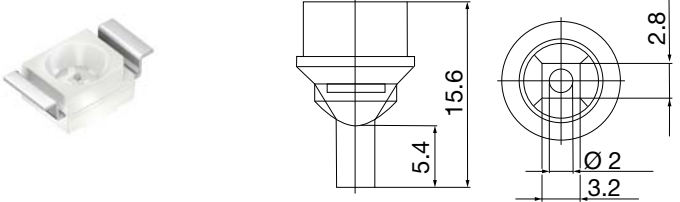
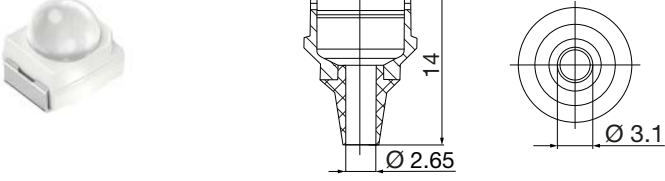
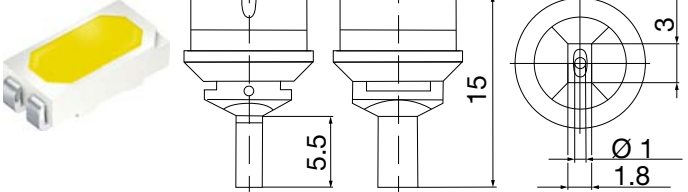
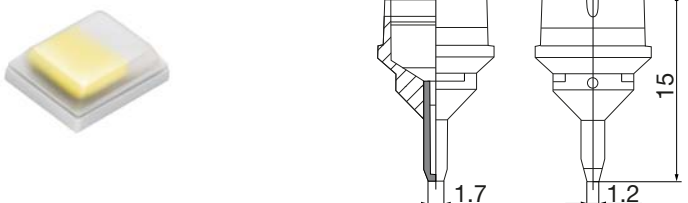
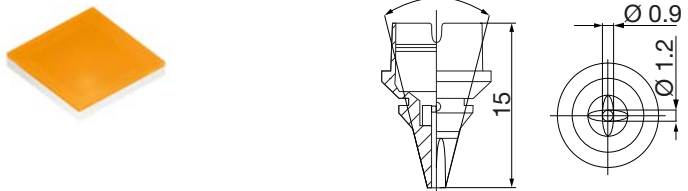
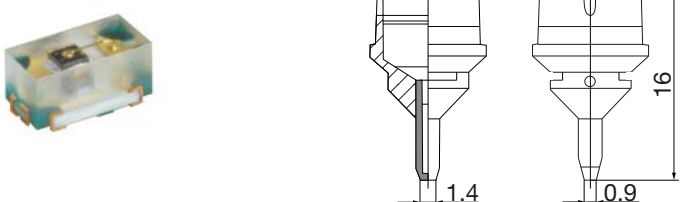
Product family	Recommended nozzle design
TOPLED Reverse Gullwing Lx T77x SFH 4253 R SFH 4257 R	SIPLACE 03055425 
TOPLED Lens LG T65X / Lx T6xx	SIPLACE 03054261 
TOPLED E3014 LUW JLSH KW DCLMS11.PC	SIPLACE 03089731 
CERAMOS CW CBLPMx.xx	SIPLACE 704 / 904 
CERAMOS Gen C1 CW VHLPD2.EN	SIPLACE 731 / 931 
CHIPLED SFH 4053 SFH4043	SIPLACE 701 / 901 

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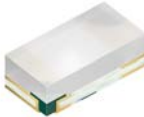
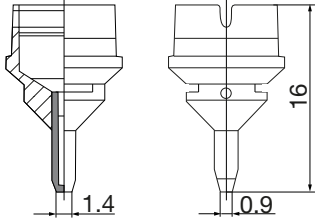

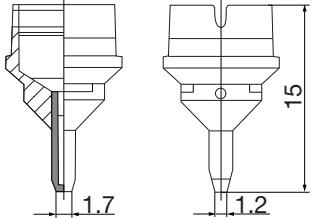

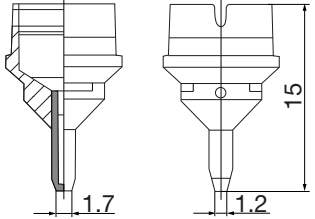
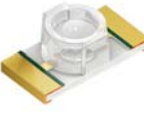
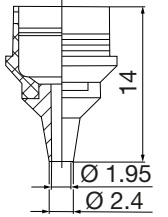

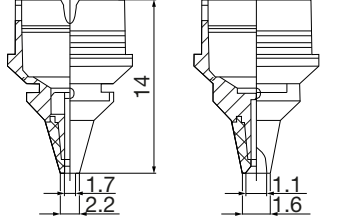

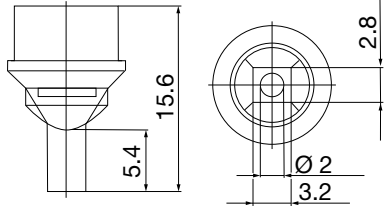
Product family	Recommended nozzle design	
CHIPLD 0402 Lx QHxG		SIPLACE 701 / 901 
CHIPLD 0603 Lx Q3xx Lx Q976		SIPLACE 704 / 904 
CHIPLD 0805 Lx R97x		SIPLACE 704 / 904 
CHIPLD with Lens SFH 4052 SFH 4046 SFH 4056		SIPLACE 328149 
CURAMOS LUW CJSN		SIPLACE 733 / 933 
DISPLIX LRTB GRxG		SIPLACE 03055425 

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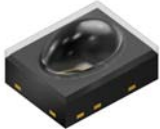
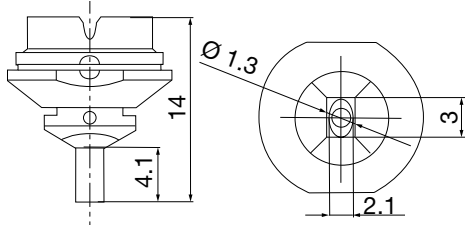
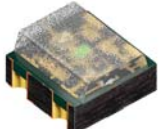
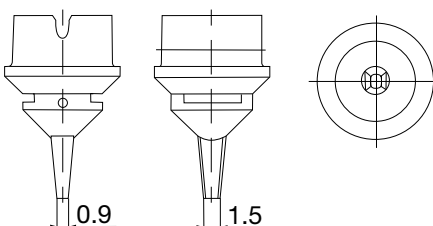

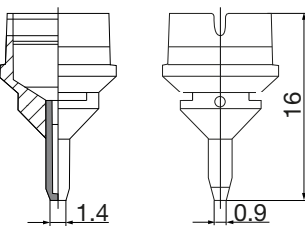

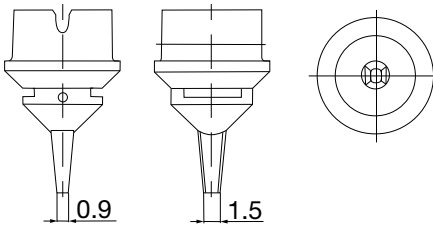

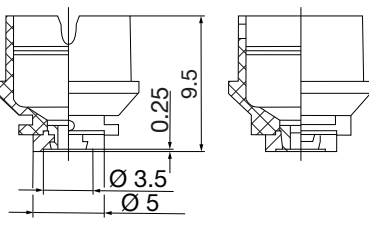

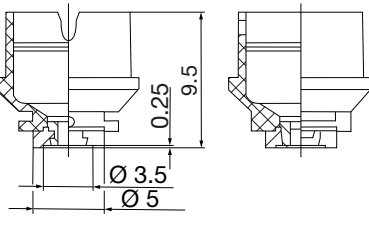
Product family	Recommended nozzle design	
DISPLIX oval Kx HAVPA1.xx		<p data-bbox="940 331 1166 360">SIPLACE 3110076</p> 
DISPLIX KRTBEILP41.32		<p data-bbox="940 607 1166 636">SIPLACE 711 / 911</p> 
FIREFLY Lx VHxx		<p data-bbox="940 889 1166 918">SIPLACE 701 / 901</p> 
FIREFLY E1608 Cx DELSS1.x2		<p data-bbox="940 1171 1166 1200">SIPLACE 711 / 911</p> 
Golden DRAGON Lx W5SM		<p data-bbox="940 1453 1166 1482">SIPLACE 739 / 939</p> 
Golden DRAGON Plus Lx W5AM LxW W5AM SFH 4232A		<p data-bbox="940 1736 1166 1765">SIPLACE 739 / 939</p> 

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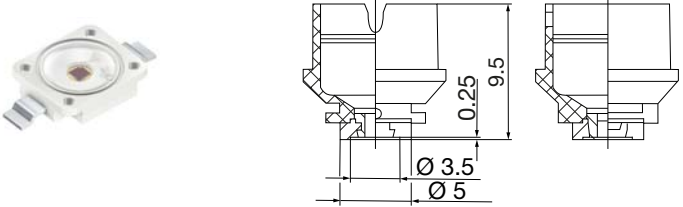
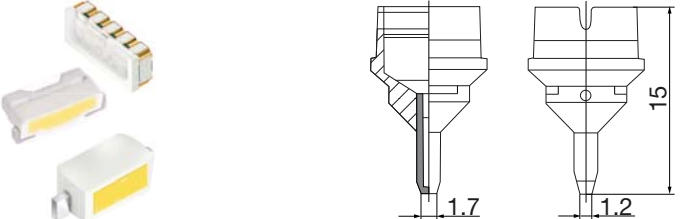
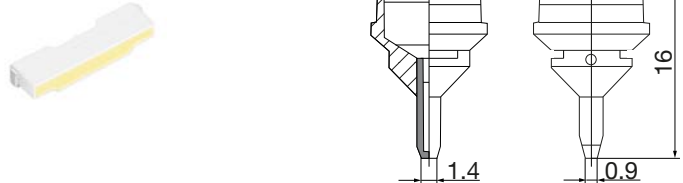
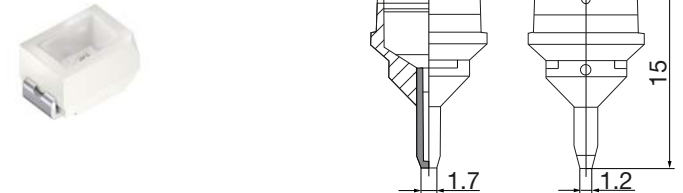
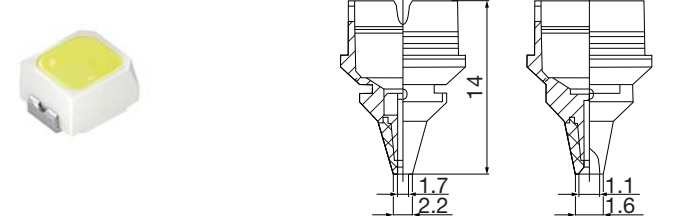
Product family	Recommended nozzle design
Platinum DRAGON Lx W5SN	SIPLACE 739 / 939 
Micro SIDELED Lx Y87x LW Y1SG KRBTQCLP61 SFH 4254	SIPLACE 704 / 904 
Micro SIDELED 3806 CUW Y3SH.B1	SIPLACE 701 / 901 
Mini TOPLED Lx M67x LCB M67x SFH 4247	SIPLACE 704 / 904 
Mini TOPLED Lx MxSG	SIPLACE 733 / 933 

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Product family	Recommended nozzle design	
MULTILED Lxxx Gxxx		SIPLACE 03055425
Multi CHIPLD LRTB RxxG		SIPLACE 730 / 930
Multi CHIPLD LTRB RxSx		SIPLACE 733 / 933
Multi TOPLED Lxx T67x LxG T77x		SIPLACE 03055425-01
OSLON Black Lx H9GP SFH 4713 / SFH 4714 SFH 4715 / SFH 4725 SFH 4716 / SFH 4726		SIPLACE 3071799
		Essemtec paraquda SP26/BN15

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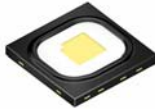
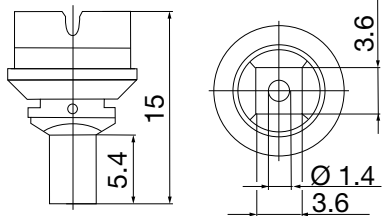

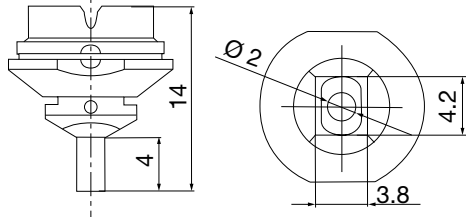

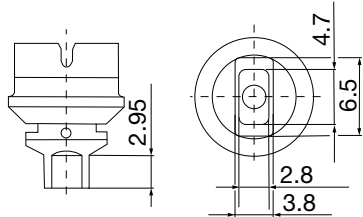

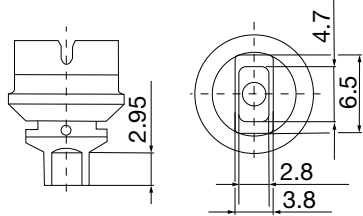

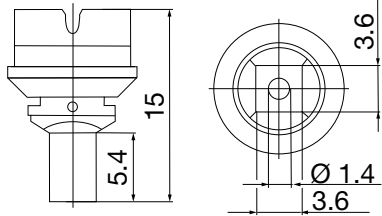
Product family	Recommended nozzle design		
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OSLON Black Flat KW HJL531.TE		SIPLACE 3110067	
OSLON Black Flat KW HKL531.TE		SIPLACE 3098314	
OSLON Black Flat KW HLL531.TE		SIPLACE 3098314	
OSLON Black Flat KW H2L531.TE		SIPLACE 3077709	

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Product family	Recommended nozzle design		
OSLON Black Flat KW H3L531.TE		SIPLACE 3110067	
		Essemtec paraquda SP26/BN36	
OSLON Black Flat KW H4L531.TE		SIPLACE 3110067	
OSLON Black Flat KW H5L531.TE		SIPLACE 3110071	
OSLON Compact CM LUW CEUN.CE		SIPLACE 711 / 911	
OSLON Compact CL LCY CEUP LUW CEUP.xx		SIPLACE 714 / 914	

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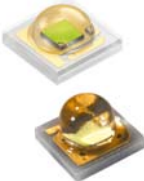
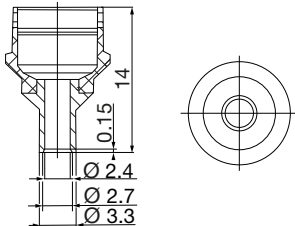
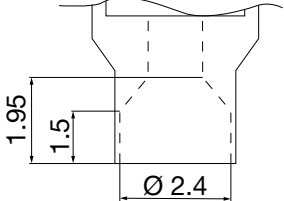

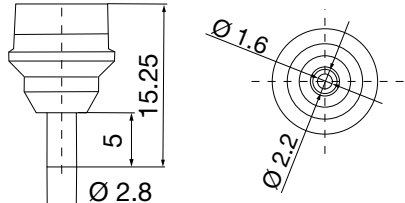

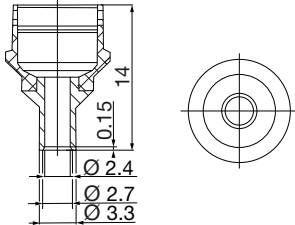
Product family	Recommended nozzle design
OSLOX SX / OSLOX MX / OSLOX LX / OSLOX Signal Lx Cxxx / Lxx Cxxx / LxW Cxxx	 <p data-bbox="940 327 1219 360">SIPLACE 03065915-02</p>  <p data-bbox="940 607 1331 640">Essemtec paraquda SP26/BN04</p> 
OSLOX Square Flat KW CSLPM2.PC	 <p data-bbox="940 887 1179 920">SIPLACE 03112073</p> 
OSLOX Square GW CSSRM1.xx LCW CQAR.xx	 <p data-bbox="940 1167 1219 1200">SIPLACE 03065915-02</p> 

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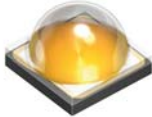
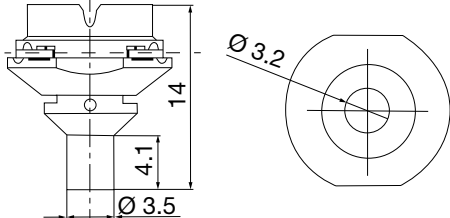
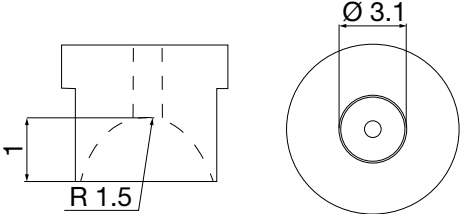

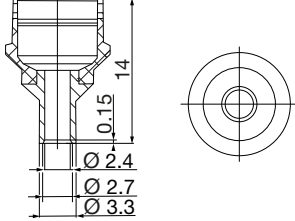

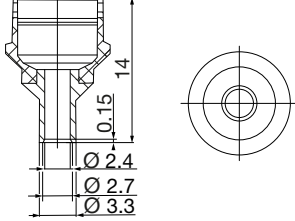
Product family	Recommended nozzle design	
OSLON Square GW CSSRM2.xx		<p data-bbox="940 327 1177 358">SIPLACE 03090409</p> 
		<p data-bbox="940 607 1270 638">ChingYi: P/N: JUK-0381/15</p> 
		<p data-bbox="940 887 1161 918">Alternative nozzle:</p> <p data-bbox="979 920 1257 952">SIPLACE 03122708-03</p> <p data-bbox="940 954 1305 985">Alternative nozzle dimensions:</p> <p data-bbox="979 987 1305 1019">Outer dimension: Ø 3.5mm</p> <p data-bbox="979 1021 1305 1052">Inner dimension: Ø 1.7mm</p>
OSLON SSL 80 White / Colors GW CS8PM1.xM LCW CR7P.xC Cx CS8pMx.xx Lx Cx7P		<p data-bbox="940 1070 1219 1102">SIPLACE 03065915-02</p> 
OSLON SSL 150 White / Colors GW CSHOM1.xM LCW CRDP.xC Gx CSHPMx.xx Lx CxDP		<p data-bbox="940 1350 1219 1382">SIPLACE 03065915-02</p> 

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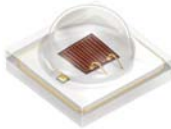
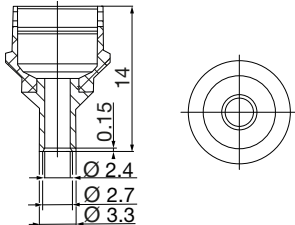
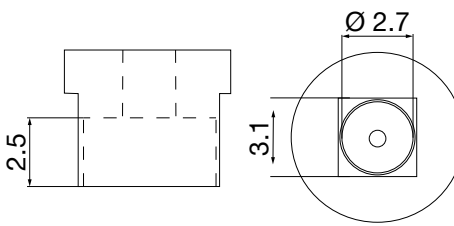

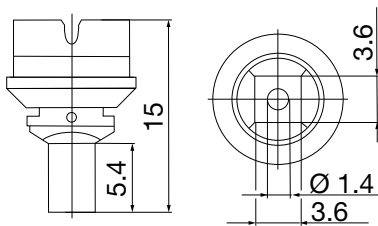

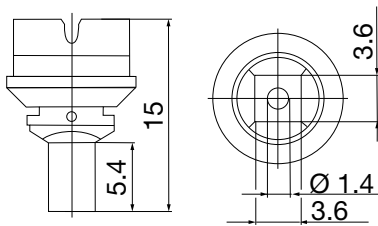
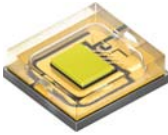
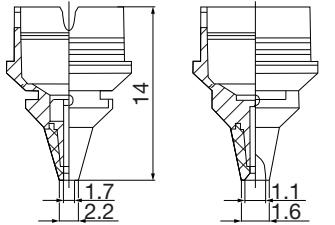

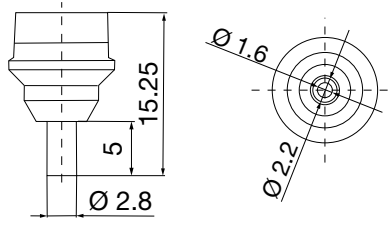
Product family	Recommended nozzle design	
OSLON SSL 120 Gx CSSPM1.xx		<p data-bbox="940 327 1219 358">SIPLACE 03065915-02</p> 
		<p data-bbox="940 607 1270 638">ChingYi: P/N: JUK-0778/16</p> 
OSLUX LUW F8xN		<p data-bbox="940 887 1163 918">SIPLACE 3077709</p> 
OSLUX SFH 4780S SFH 4786S SFH 4796S SFH 4787S		<p data-bbox="940 1167 1150 1198">SIPLACE 3077709</p> 
OSRAM OSTAR Headlamp SMT LE UW Q9WP		<p data-bbox="940 1447 1171 1478">SIPLACE 733 / 933</p> 
OSRAM OSTAR Projection Com- pact KW CSLNM1.TG		<p data-bbox="940 1727 1179 1758">SIPLACE 03112073</p> 

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio

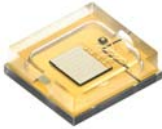
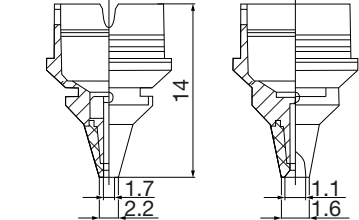
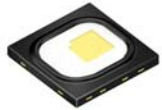
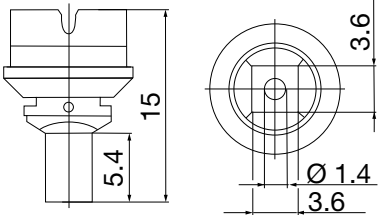
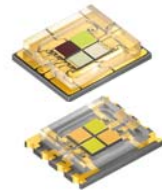
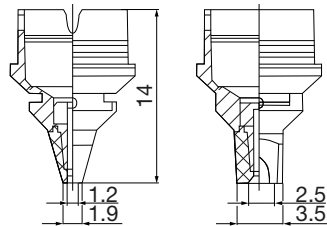
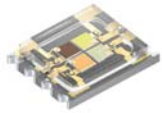
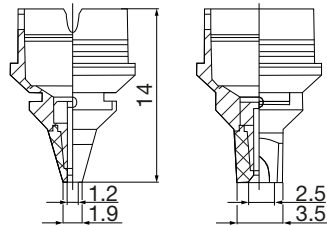

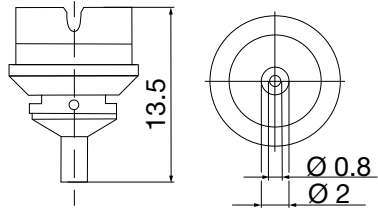

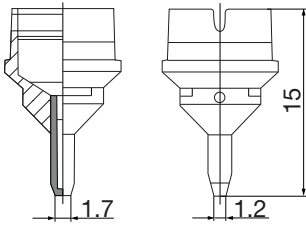
Product family	Recommended nozzle design	
OSRAM OSTAR Projection Compact LE x Q9Wx LE BA Q6WM LCR H9RN LE x Q8WP LE x Q7WP		SIPLACE 733 / 933 
OSRAM OSTAR Projection Cube LCG H9Rx		SIPLACE 3077709 
OSRAM OSTAR Stage LE RTDUW S2Wx LE x Q8WP		SIPLACE 735 / 935 
OSRAM OSTAR Medical LE xxxx S2W		SIPLACE 735 / 935 
PointLED Lx P4xx		SIPLACE 3010529-01 
Power SIDELED Lx B6SP		SIPLACE 704 / 904 

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


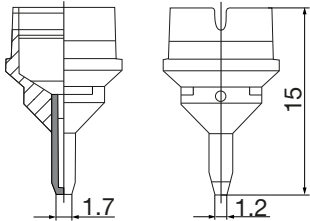

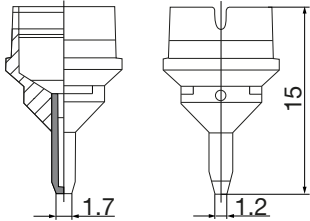

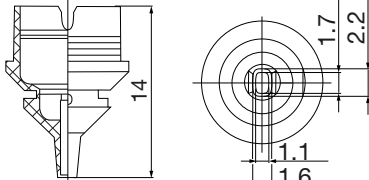

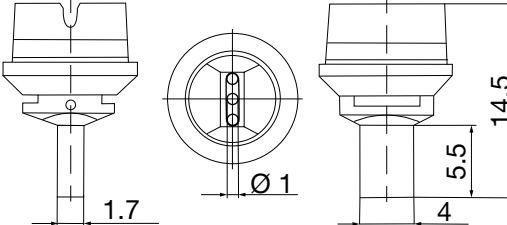

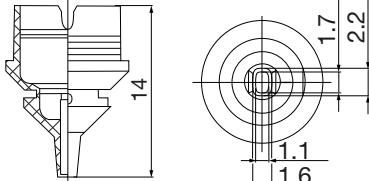
Product family	Recommended nozzle design		
SIDELED Lx A67x SFH 4256 SFH 4244 SFH 4255		SIPLACE 704 / 904 	
SMARTLED 0603 Lx L2xx SFH 4050		SIPLACE 704 / 904 	
SYNIOS P2720 Kx DMLx31 SFH 4770S		SIPLACE 713 / 913 	
SYNIOS E4014 KW DPLS3x		SIPLACE 03024486 	
DURIS E 2 GW JBLMSxEM		SIPLACE 713 / 913 	
			Alternative nozzle: ChingYi: P/N: JUK-0344/17

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio

Product family	Recommended nozzle design		
DURIS E 3 GW JCLPSx.Ex LUW JNSH.xC		SIPLACE 03089731	
		Alternative nozzle: ChingYi: P/N: JUK-0436/15	
DURIS E 5 GW JDSxS1.xC GW JDSxSx.EM		SIPLACE 03085563	
		Alternative nozzle: ChingYi: P/N: JUK-0436/15	
DURIS P 5 GWDASPA1.EC Gx DASPA1.xx		SIPLACE 0328149	
DURIS P 8 GW PUSRA1.PM		ChingYi: P/N: JUK-0461/15	

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


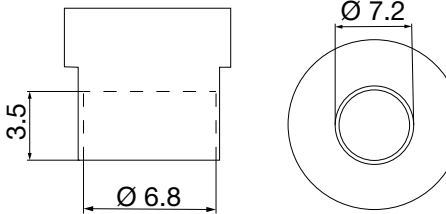
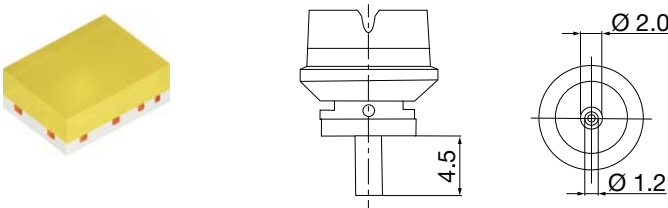
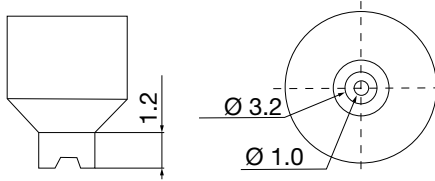
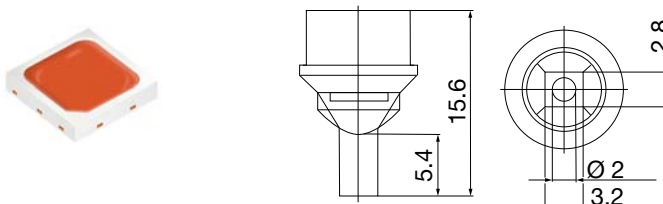
Product family	Recommended nozzle design
DURIS P 10 GW P7STAx.PM	SIPLACE 3138682 
	ChingYi: P/N: JUK-0695/13 
DURIS S 2 GW SBLMAx.EM	SIPLACE 3117100 
	JUKI "KE-2080RL"; Nozzle 503 
	Alternative nozzles: Essemtec paraquda SP26/BN39 Ching Yi Nozzle JUK-0049/15 Ching Yi Nozzle 104590801403 (D)
DURIS S 5 Gx PSLx31.xx GW PSLPS1.xC GW PSLRS1.xC	SIPLACE 03055425 
	Alternative nozzle dimensions: Outer dimension: Ø 3.0mm Inner dimension: Ø 1.5mm

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


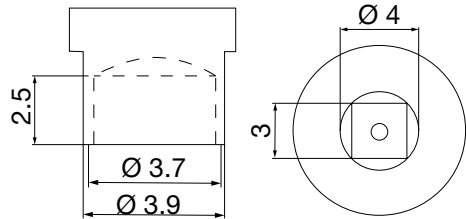

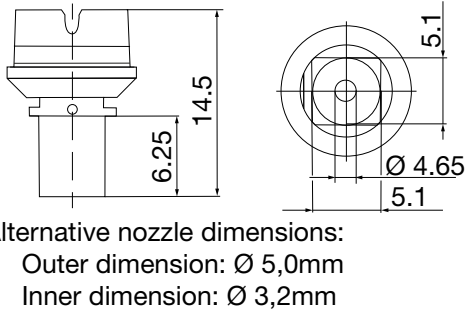

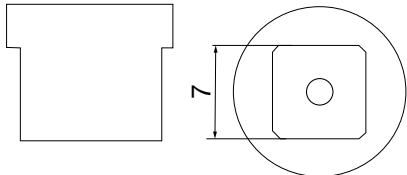
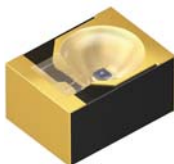
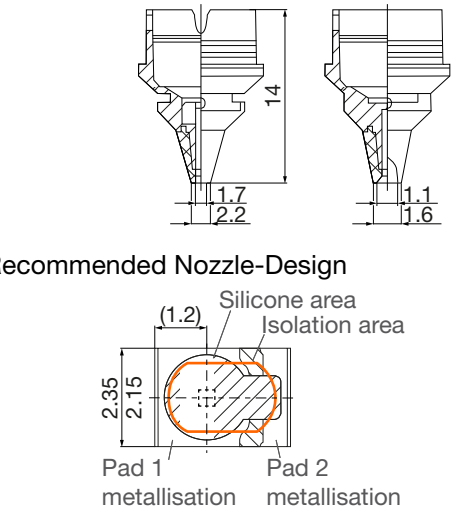

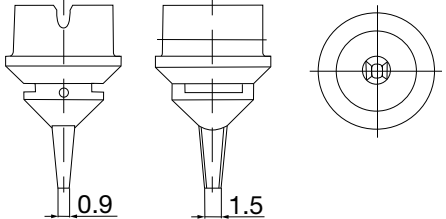

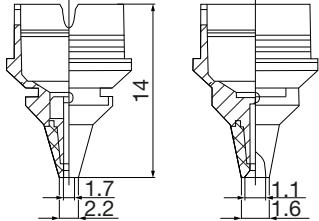
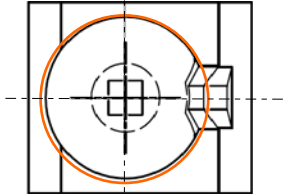

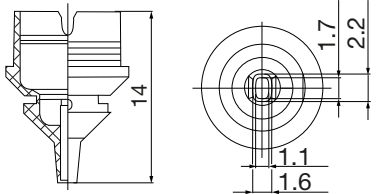
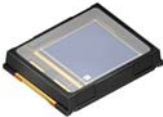
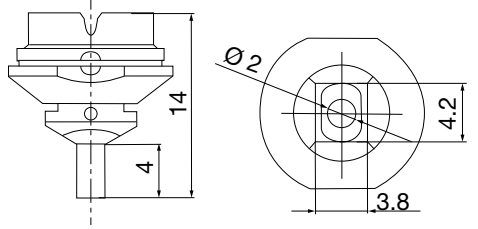
Product family	Recommended nozzle design	
DURIS S 5E GW JSLPS1.EM		ChingYi: P/N: JUK-0130/17 
DURIS S 8 GW P9Lx3x.xM		SIPLACE 3083400 
DURIS S 10 GW P7LP32.xM		ChingYi: P/N JUK-0342/17 
MIDLED Toplooker SFH 4651 SFH 4641 SFH 4650 SFH 4640		SIPLACE 733 / 933 

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio

Product family	Recommended nozzle design	
MIDLED Sidelooker SFH 4656 SFH 4646 SFH 4655 SFH 4645 SFH 4647		SIPLACE 711 / 911 
Mini MIDLED SFH 4451 SFH 4441		SIPLACE 733 / 933  <p data-bbox="940 887 1310 918">Recommended Nozzle-Design</p>  <p data-bbox="979 1144 1337 1173">min. inner diameter: \varnothing 1.7mm</p>
T-MIDLED Sidelooker SFH 4140		SIPLACE 713 / 913 
IR TOPLED D5140 SFH 2200 SFH 2240		SIPLACE 3110067 



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