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# Products

## Epitaxial chips for use in optoelectronic devices

A photograph of a square, light blue-green epitaxial chip. The surface is covered in a dense, regular grid of small, raised circular bumps. There are several irregular white patches and markings on the chip's surface, likely representing different functional regions or manufacturing marks.

**Edition 2018/11**

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	I <sub>Vmin</sub> [mcd]	I <sub>Vtyp</sub> [mcd]	I <sub>F</sub> [mA]
<i>STANDARD RED</i> GaAsP/GaAs p-side up	101205	660	1.65	1.84	0.30	0.60	20
	102205	660	1.65	1.84	0.25	0.40	10
	105201	660	1.80	1.90	0.09	0.12	10
	105202A	660	1.60	1.70	0.04	0.06	3
	105205	660	1.65	1.84	0.15	0.20	5
	105206	660	1.65	1.84	0.17	0.25	7
	105207	660	1.65	1.84	0.15	0.20	20
	105207E	660	1.65	1.84	0.15	0.20	20
	105208	660	1.65	1.84	0.15	0.20	7
	105209	660	1.65	1.84	0.15	0.20	7

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	I <sub>Vmin</sub> [mcd] P <sub>o min</sub> *[mW]	I <sub>Vtyp</sub> [mcd] P <sub>o typ</sub> *[mW]	I <sub>F</sub> [mA]
<i>RED</i> GaAlAs/GaAs DHS n-side up DHS p-side up GaAlAs/GaAlAs DDH n-side up  With Passivation   DDH p-side up	114130	650	1.85	2.10	9.0	14.0	20
	114230	650	1.85	2.10	9.0	12.0	20
	190153	635	1.90	2.20	10.0	13.0	20
	115183	650	1.90	2.30	22.0	28.0	20
	115183	655	1.90	2.30	22.0	28.0	20
	115183-660	660	1.90	2.30	16.0	22.0	20
	115183-660-LP	660	1.90	2.30	0.9*	1.3*	20
	115183-660	660	1.90	2.30	1.7*	2.0*	20
	115183S-660	660	1.90	2.30	2.0*	2.8*	20
	115186-660	660	1.70	2.00	1.2*	1.8*	20
	115183-663	663	1.90	2.30	1.6*	2.2*	20
	115183-665	665	1.90	2.30	1.6*	2.2*	20
	11518XL-660	660	1.75	2.00	2.5*#	3.0*#	100/50#
	11518XL2-660	660	1.80	2.10	7.0**	9.0**	350
	115260	660	1.90	2.20	12.0	16.0	20
	115283	660	1.90	2.20	17.0	22.0	20
115283-660-5	660	1.90	2.20	1.5*	2.1*	20	
11528XL-660	660	1.75	2.00	3.6*	4.0*	100/50#	

\*\* I<sub>e</sub> in mW/sr

# measurement current for P<sub>o</sub>

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	P <sub>Omin</sub> [mW]	P <sub>Otyp</sub> [mW]	I <sub>F</sub> [mA]
<i>INFRA-RED</i>							
GaAlAs/GaAlAs DDH n-side up	115161L	670	1.90	2.30	1.8	2.5	20
	11516LXL	670	1.80	2.10	3.0 <sup>#</sup>	4.0 <sup>#</sup>	100/50 <sup>#</sup>
DDH p-side up	115261L	675	1.90	2.30	2.0	2.8	20
	11526LXL	680	1.75	2.00	4.2 <sup>#</sup>	5.5 <sup>#</sup>	100/50 <sup>#</sup>
DDH n-side up	115161H	680	1.90	2.30	2.0	3.0	20
	115164H	680	1.85	2.30	2.0	3.0	20
	11516HXL	680	1.65	1.95	4.2 <sup>#</sup>	6.5 <sup>#</sup>	100/50 <sup>#</sup>
	11516HXL2	680	1.80	2.10	8.0**	10.0**	350
	137141L	690	1.80	2.20	2.0	3.5	20
	137144L	690	1.80	2.20	2.0	3.5	20
	13714LXL	690	1.80	1.95	4.2 <sup>#</sup>	7.0 <sup>#</sup>	100/50 <sup>#</sup>
	137141	700	1.80	2.20	2.0	3.5	20
	137140	700	1.90	2.30	2.0	2.5	20
	13714XL	700	1.75	2.00	4.2 <sup>#</sup>	6.5 <sup>#</sup>	100/50 <sup>#</sup>
DDH p-side up	137141H	710	1.80	2.10	2.0	2.5	20
	137241H	710	1.75	2.00	2.0	3.5	20
	13724HXL	710	1.75	2.00	4.2 <sup>#</sup>	7.0 <sup>#</sup>	100/50 <sup>#</sup>
DDH n-side up	127141L	720	1.70	2.10	2.5	4.0	20
	12714LXL	720	1.65	1.90	4.5 <sup>#</sup>	7.0 <sup>#</sup>	100/50 <sup>#</sup>

\*\* I<sub>e</sub> in mW/sr

<sup>#</sup> measurement current for P<sub>o</sub>

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	P <sub>Omin</sub> [mW]	P <sub>Otyp</sub> [mW]	I <sub>F</sub> [mA]	
DDH n-side up	127141D	724	1.70	1.95	2.8	4.0	20	
	127141N	730	1.70	2.10	2.8	4.0	20	
	12714NXL	730	1.65	1.90	4.5 <sup>#</sup>	6.5 <sup>#</sup>	100/50 <sup>#</sup>	
DDH p-side up	127244N	730	1.70	2.00	2.8	3.5	20	
	12724NXL	730	1.65	1.90	4.5 <sup>#</sup>	7.0 <sup>#</sup>	100/50 <sup>#</sup>	
DDH n-side up	127141	740	1.70	2.10	3.0	4.0	20	
	127144	740	1.65	2.00	3.0	4.5	20	
	12714XL	740	1.70	1.90	2.5 <sup>#</sup>	3.3 <sup>#</sup>	100/20 <sup>#</sup>	
DH n-side up	127124	740	1.70	2.00	0.6	0.8	20	
DDH n-side up	127141H	750	1.65	1.95	3.0	4.5	20	
	12714HXL	750	1.70	2.00	3.5 <sup>#</sup>	4.5 <sup>#</sup>	100/20 <sup>#</sup>	
	124141L	760	1.70	2.00	3.5	4.5	20	
	124144L	760	1.65	1.95	3.5	4.5	20	
	12414LXL	760	1.65	1.90	3.5 <sup>#</sup>	4.5 <sup>#</sup>	100/20 <sup>#</sup>	
	124254L	760	1.65	1.95	4.0	5.0	20	
	12424LXL	760	1.55	1.90	3.5 <sup>#</sup>	4.5 <sup>#</sup>	100/20 <sup>#</sup>	
	124141	770	1.65	1.90	3.5	4.5	20	
	124144	770	1.65	1.90	3.5	5.0	20	
	12414XL	770	1.65	1.90	3.5 <sup>#</sup>	4.5 <sup>#</sup>	100/20 <sup>#</sup>	
	DDH p-side up	124241	770	1.65	1.90	3.5	5.0	20
		124244	770	1.60	1.90	3.5	5.0	20
12424XL		770	1.65	1.90	3.5 <sup>#</sup>	4.5 <sup>#</sup>	100/20 <sup>#</sup>	
DDH n-side up	124144H	780	1.70	2.10	3.5	4.5	20	
	12414HXL	780	1.55	1.90	3.5 <sup>#</sup>	4.5 <sup>#</sup>	100/20 <sup>#</sup>	
	132141L	790	1.70	2.00	3.0	4.0	20	

<sup>#</sup>measurement current for Po

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	P <sub>Omin</sub> [mW]	P <sub>Otyp</sub> [mW]	I <sub>F</sub> [mA]	
<i>INFRA-RED</i> GaAlAs/GaAlAs DDH n-side up	132141	800	1.45	1.70	4.0	4.5	20	
	132141R	800	1.45	1.55	3.5	4.5	20	
	132144	800	1.50	1.80	4.0	4.5	20	
	13214XL	800	1.60	1.90	3.0 #	4.5 #	100/20#	
	125144L	805	1.50	1.80	3.0	4.5	20	
	125144	810	1.50	1.65	3.3	5.0	20	
	12514XL-810	810	1.45	1.70	3.0 #	4.5 #	100/20#	
	125144D	812	1.55	1.80	2.8	4.0	20	
	DDH p-side up	125244	810	1.50	2.00	2.8	3.2	20
		125254-810	810	1.45	1.70	4.5	6.0	20
		12524XL-810	810	1.45	1.70	3.5 #	4.5 #	100/20#
	DDH n-side up	134144	820	1.55	1.80	2.5	3.4	20
		13414XL	820	1.55	1.80	3.0 #	4.0 #	100/20#
		135144L	830	1.55	1.80	2.5	3.4	20
	DDH p-side up	135244L	830	1.45	1.65	4.5	6.0	20
		13524LXL	830	1.45	1.75	4.0 #	5.5 #	100/20#

#measurement current for P<sub>o</sub>

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	Po <sub>min</sub> [mW]	Po <sub>typ</sub> [mW]	I <sub>F</sub> [mA]	
DDH n-side up	135144	840	1.55	1.80	4.0	5.5	20	
	136154	850	1.50	1.80	4.0	5.5	20	
	13615XL	850	1.35	1.50	3.5 #	4.5 #	100/20#	
DDH p-side up	136274	850	1.35	1.60	4.5	6.0	20	
	13627XL	850	1.35	1.50	4.0 #	5.5 #	100/20#	
DH n-side up	126124	860	1.30	1.60	0.9	1.2	20	
DDH n-side up	126164	870	1.35	1.60	5.1	6.2	20	
	12616XL	870	1.40	1.60	4.5 #	5.5 #	100/20#	
DDH p-side up	126244F	870	1.30	1.50	2.5	3.0	20	
	126284	865	1.38	1.60	5.0	6.2	20	
	126260H	870	1.40	1.60	5.5	7.0	20	
	126281H	870	1.40	1.60	5.5	6.5	20	
	126284H	870	1.38	1.55	5.0	6.5	20	
	126286H	870	1.35	1.55	5.0	6.5	20	
	12628HXL	870	1.35	1.50	5.0 #	6.0 #	100/20#	
	126251	875	1.30	1.50	2.8	3.8	20	
	126254	875	1.30	1.50	3.2	4.5	20	
	126256	875	1.30	1.50	2.8	3.8	20	
	DDH n-side up	126164H-880	880	1.35	1.60	4.4	5.5	20
		126164H-890	890	1.35	1.60	3.4	4.5	20
	SH n-side up	123144	885	1.30	1.50	1.3	2.0	20
DDH p-side up	126254H-890	890	1.30	1.60	3.0	4.0	20	
	12625HXL-890	890	1.35	1.60	3.0 #	3.8 #	100/20#	

#measurement current for Po

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	P <sub>o_min</sub> [mW]	P <sub>o_typ</sub> [mW]	I <sub>F</sub> [mA]
<i>INFRA-RED</i>							
GaAlAs/GaAlAs DDH p-side up	133254-900	900	1.25	1.50	3.0	4.0	20
	13325XL-900	900	1.30	1.45	3.0 #	4.0 #	100/20#
DDH n-side up	133131-905	905	1.30	1.60	1.2	1.8	20
	13315XL-905	905	1.30	1.50	3.0 #	4.0 #	100/20#
DDH p-side up	133154-905	905	1.30	1.60	3.0	4.2	20
	133254-905	905	1.25	1.50	3.0	4.0	20
	133254-910	910	1.30	1.45	3.0	4.0	20
DDH n-side up	13325XL-910	910	1.25	1.40	3.2 #	4.2 #	100/20#
	133154-910	910	1.30	1.60	3.0	4.0	20
SH n-side up	128144	910	1.30	1.50	1.3	1.8	20
DDH n-side up	133154-915	915	1.30	1.60	3.0	4.0	20
DDH p-side up	128254-920	920	1.25	1.50	3.0	4.0	20
	12825XL-920	920	1.20	1.40	5.5 #	7.0 #	100/50#
DDH n-side up	131144-940	940	1.30	1.50	1.3	1.9	20
DDH p-side up	128254-950	950	1.25	1.50	2.8	3.4	20

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	P <sub>o_min</sub> [mW]	P <sub>o_typ</sub> [mW]	I <sub>F</sub> [mA]
GaAs/GaAs n-side up p-side up n-side up	120124	925	1.20	1.40	0.9	1.0	20
	120214	925	1.20	1.40	0.6	0.8	20
	120234-940	940	1.25	1.50	2.8	3.4	20
	12023XL-940	940	1.20	1.40	2.0 #	3.0 #	100/50#
	120234-950	950	1.25	1.40	1.0	1.3	20
	12023XL-950	950	1.20	1.40	2.0 #	2.5 #	100/50#
	120134	950	1.25	1.40	1.0	1.5	20
GaAlAs/GaAs p-side up	131234-940	940	1.20	1.40	2.5	3.5	20
	13123XL-940	940	1.20	1.30	4.5 #	6.5 #	100/50#
	131234-950	950	1.25	1.45	2.5	3.4	20
	13123XL-950	940	1.15	1.30	4.5 #	6.5 #	100/50#

#measurement current for Po

Material	Item No.	Wavelength [ $\lambda_p$ / nm]	V <sub>Ftyp</sub> [V]	V <sub>Fmax</sub> [V]	P <sub>Omin</sub> [mW]	P <sub>Otyp</sub> [mW]	I <sub>F</sub> [mA]
MQW-GaAlAs p-side up	131254-940	940	1.20	1.40	1.6	2.0	20
	131254-960	960	1.20	1.45	2.0	3.0	20
	13125XL-960	960	1.30	1.45	4.0 <sup>#</sup>	6.0 <sup>#</sup>	350/50 <sup>#</sup>
	131254-970	970	1.25	1.45	2.0	3.0	20
	13125XL-970	970	1.30	1.45	4.0 <sup>#</sup>	5.5 <sup>#</sup>	350/50 <sup>#</sup>
	131254-980	980	1.25	1.45	2.0	3.0	20
	13125XL-980	980	1.30	1.45	4.0 <sup>#</sup>	5.5 <sup>#</sup>	350/50 <sup>#</sup>
	150234-1020	1020	1.30	1.50	5.0 <sup>#</sup>	7.5 <sup>#</sup>	100/50 <sup>#</sup>
	15022XL-1020	1020	1.20	1.40	5.0 <sup>#</sup>	7.0 <sup>#</sup>	350/50 <sup>#</sup>
	150234-1050	1050	1.25	1.40	3.5 <sup>#</sup>	4.5 <sup>#</sup>	100/50 <sup>#</sup>
	15022XL-1050	1050	1.20	1.40	3.5 <sup>#</sup>	4.0 <sup>#</sup>	350/50 <sup>#</sup>
	150234-1060	1060	1.25	1.40	3.0 <sup>#</sup>	4.0 <sup>#</sup>	100/50 <sup>#</sup>
	15022XL-1060	1060	1.20	1.40	3.0 <sup>#</sup>	3.5 <sup>#</sup>	350/50 <sup>#</sup>
	150234-1070	1070	1.25	1.40	3.0 <sup>#</sup>	4.0 <sup>#</sup>	100/50 <sup>#</sup>
	15022XL-1070	1070	1.20	1.40	3.0 <sup>#</sup>	3.5 <sup>#</sup>	350/50 <sup>#</sup>
	150234-1140	1140	1.20	1.40	0.6 <sup>##</sup>	1.0 <sup>##</sup>	100 <sup>##</sup>
15022XL-1140	1140	1.15	1.35	2.8 <sup>##</sup>	4.0 <sup>##</sup>	350 <sup>##</sup>	

<sup>#</sup> measurement current for P<sub>o</sub>

<sup>##</sup> I<sub>e</sub> in mW/sr



<b>Material</b>	<b>Item No.</b>	<b>Wavelength</b> [ $\lambda_p$ / nm] [ $\lambda_d$ / nm] <sup>x</sup>	<b>V<sub>Ftyp</sub></b> [V]	<b>V<sub>Fmax</sub></b> [V]	<b>I<sub>Vmin</sub></b> [mcd]	<b>I<sub>Vtyp</sub></b> [mcd]	<b>I<sub>F</sub></b> [mA]
<i>GREEN</i> AlInGaP/GaAs p-side up  pure green	160272	575 <sup>x</sup>	2.10	2.40		65.0	20
	16028XL	575 <sup>x</sup>	2.10	2.35		900.0	350
	161230	560 <sup>x</sup>	2.20	2.50		11.0	20
<i>YELLOW</i> GaAsP/GaP p-side up  Low current  <i>YELLOW</i> AlInGaP/GaAs p-side up	170220	590 <sup>x</sup>	2.20	2.50	3.5	6.0	20
	170622	590 <sup>x</sup>	1.85	2.05	0.18	0.30	2
	170282	590 <sup>x</sup>	2.10	2.40		70.0	10
	17028XL	590 <sup>x</sup>	2.10	2.30		1000.0	100
<i>ORANGE</i> AlInGaP/GaAs p-side up	190282	625 <sup>x</sup>	2.10	2.40		110.0	20
	19028XL	625 <sup>x</sup>	2.10	2.40		750.0	100
<i>RED</i> AlInGaP/GaAs p-side up	Thin layer 193252	631 <sup>x</sup>	2.10	2.40		15.0	20
	193280	631 <sup>x</sup>	2.10	2.40		55.0	20
	194273	635 <sup>x</sup> /645	2.10	2.40		35.0	20
	195273	640 <sup>x</sup> /655	2.10	2.40		30.0	20
	196273	660	2.10	2.40		25.0	20

On request most of the dice can also be delivered in the following chip size classes:

**Order No.:**

1	1	5	1	8	3
1	X	X	X	X	X

Technology.  
 Peak. wavelength

1 = n-on top  
 2 = p-on top  
 Low current  
 5 = n-on top  
 6 = p-on top

Luminous  
 intensity  
 classes

Chip dimensions:  
 0 ≅ 265 μm +/- 10 μm  
 1 ≅ 325 μm +/- 10 μm  
 2 ≅ 235 μm +/- 10 μm  
 3 ≅ 295 μm +/- 10 μm  
 4 ≅ 365 μm +/- 10 μm  
 5 ≅ 255 μm +/- 10 μm  
 6 ≅ 465 μm +/- 10 μm  
 7 ≅ 350 μm +/- 10 μm  
 8 ≅ 700 μm +/- 10 μm  
 9 ≅ 205 μm +/- 10 μm  
 XL ≅ 960 μm +/- 10 μm  
 XL2 ≅ 1960 μm +/- 10 μm

**Neu**

1 1 5 1 8 M189 - 660 - 3