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Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
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Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
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Набережные Челны (8552)20-53-41
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Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
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Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
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Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
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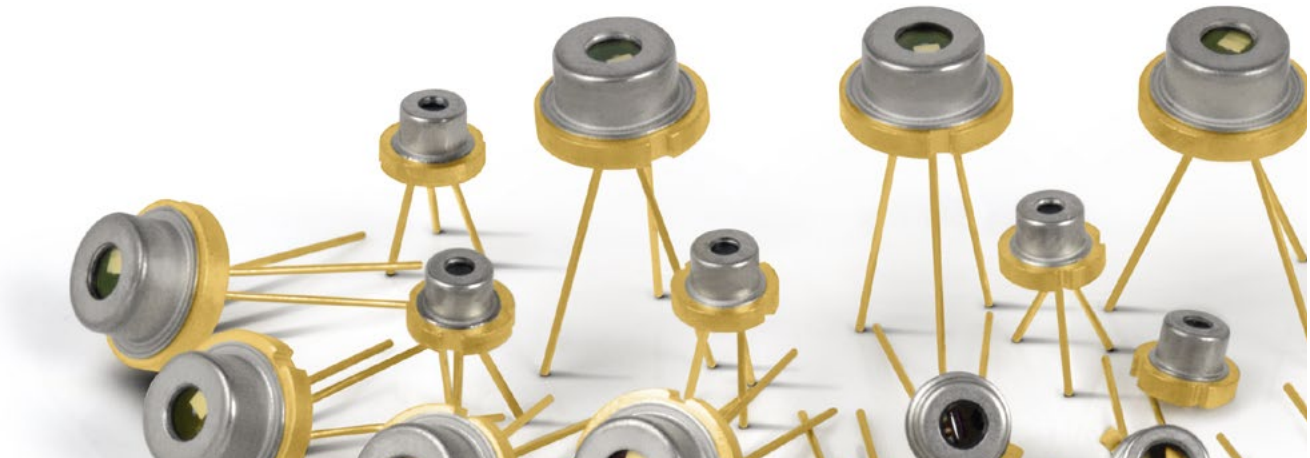
PULSED LASER DIODES



PULSED LASER DIODES

What Do We Offer?

LASER COMPONENTS manufactures pulsed laser diodes primarily at 850 nm, 905 nm and 1550 nm, with other wavelengths available upon request. As well as single and stacked emitters, we specialize in multi-junction laser diodes with several emitters in one chip.

Pulsed laser diodes with integrated fast axis lenses (FAC) or fiber optic pigtails offer added flexibility to the user. A world novelty is our QuickSwitch® PLD with integrated high speed driver. Read more over the next few pages.

Custom Products

LASER COMPONENTS Canada has made a name for itself as a supplier of bespoke products, having specialized in custom projects since day one. Talk to us about your requirements - custom products are often less expensive than you might expect.

Naturally we also offer a wide range of off-the-shelf technology which may well meet your exact needs – call us for more details.

Nomenclature

Our product nomenclature allows you to see at a glance what's what – details are given below.

λ	Tol	Type	Width	Package

Wavelength

850	850 nm
905	905 nm
155	1550 nm
HI155	1550 nm High intensity

Wavelength Tolerance

D	± 10 nm
G	± 30 nm
H	± 40 nm

Device Type

1S	Single chip
XS	Stacked devices with x chips
1SXJ	Multi-junction elements
XSXJ	Multi-junction devices

Contact Stripe Width

03	75 µm
06	150 µm
09	225 µm
12	300 µm
16	400 µm
	etc. 01 ≙ 25 µm

Package

C	8-32 coax
R	9 mm
S	TO-18
U	5.6 mm
UA	5.6 mm low cost
Y	Ceramic
FP	Fiber-coupled

BASICS

Pulsed laser diodes have their roots in military applications. They are ideally suited to range-finding thanks to their short pulse widths and high output powers. Improvements in technology and cost-efficiency have opened up new areas of application in automotive, industrial safety scanner, metrology and medicine.

Principle of Operation

Most laser diodes are designed to emit in continuous wave (cw) mode with powers from a few milliwatts to a few watts. Such diodes are not designed to be overdriven; if the specified maximum power is exceeded, even for a short time, the laser resonator may be damaged, after which laser output will cease.

Pulsed laser diodes, however, are designed to be overdriven for short periods. To achieve the high peak powers demanded by the application, the duty cycle must be kept very low, typically 0.1 %. For example, a 100 ns pulse is followed by a pause of 100 µs, which means that very short pulses can be used with repetition rates in the kHz range. The maximum pulse lengths that can be achieved are therefore typically in the 200 ns range. Laser currents on the order of several tens of amperes are used to create these light pulses, which require fast switching transistors and appropriate circuit with all electrical connections as short as possible to diminish inductive losses.

Characteristics

The emission wavelength of a laser diode depends primarily upon the materials used in the active and passive layers of the semiconductor.
Typical wavelengths for commercially available pulsed laser diodes are 850–870 nm, 905 nm, and 1550 nm. The AlGaAs structure of the 905 nm devices is well known for its reliability, beam characteristics and temperature stability. The high efficiency allows powers of up to 34 W to be reached with single emitters, and of up to 130 W for stacked devices, for typical pulse lengths of 150 ns. Multi-junction pulsed laser diodes are similar to nanostack technology with multiple epitaxically stacked emitters. Single chips allows power up to 80 W, stacks up to 650 W. Available packages include hermetic metal cans (e.g. TO-18, 5.6 mm, 9 mm or coaxial) and pigtailed versions.

The 1550 nm devices available in the mid-IR can be operated at higher peak power than the 905 nm and still be regarded as eye safe since the laser radiation is not focused directly on the retina. These diodes are based on InP with additional InGaAsP layers, and can be manufactured either by molecular beam epitaxy (MBE) or metal-organic chemical vapor deposition (MOCVD). Peak output powers of up to 50 W can be reached thanks to the efficiency of 0.5 W/A.

Reliability

As with other light sources the life time of a pulsed laser diode is highly dependent on operating conditions. Without damage, the devices can be subjected to significant overdrive for short periods of time or when the pulse energy is reduced by employing pulse durations as short as 2 ns. The user should choose the appropriate device and drive conditions to suit the application and the operating lifetime required. Whereas lifetimes of less than an hour are enough for certain military applications such as thyristor ignition, industrial safety scanners in three-shift environments need to run reliably for tens of thousands of hours.
The following formula has been derived from many years of experience with 905 nm pulsed laser diodes and gives an indication of mean time to failure (MTTF) as a function of a range of parameters:

$$MTTF = 3.9 \cdot 10^{20} \cdot \{P_o/L\}^{-6} \cdot t_w^{-2} \cdot F^{-1} \cdot f(T)$$

(Estimation for triple junction laser: $MTTF = 1.11 \cdot 10^{21} \cdot \{P_o/L\}^{-6} \cdot t_w^{-2} \cdot F^{-1} \cdot f(T)$)

where

MTTF	[hours]	= Mean time to failure
P_o	[mW]	= Optical peak power
L	[µm]	= Emitter length
t_w	[ns]	= Pulse length
F	[kHz]	= Repetition rate
f(T)		= Temperaturedependant multiplying factor (= 1 at 25°C)

Example:
At room temperature the typical MTTF for a 4 W pulsed laser diode with 75 µm emitter, 100 ns pulse length and 10 kHz repetition rate would be approx. 170,000 hours. If the power is increased to 6 W with all other parameters unchanged the lifetime is reduced to 15,000 hours. Emitter length is equally important – if the power is halved, or the emitter length doubled, the lifetime is increased by a factor of sixty-four.

850 nm
Pulsed Laser Diodes

Our 850 nm PLDs are available as single chip with 13 W in a range of packages including TO-18, 5.6 mm, 9 mm, 8-32 coax and chip-on-ceramic.

Generic Specifications at 21°C

	Min.	Typ.	Max.
Wavelength [nm]	835	850	860
Spectral bandwidth [nm]		5.5	
Temperature coefficient [nm/°C]		0.21	
Beam spread (FWHM)			
Parallel to junction plane [degrees]		10.5	
Perpendicular		20	
Reverse voltage [V]			6
Pulse duration [ns]			150
Duty factor [%]			0.1
Temperature			
Storage [°C]	-55		100
Operating [°C]	-45		85

850 nm Series

The 850 series can be characterized as absolutely reliable; it features a low divergence of 10.5° x 20° and high temperature stability up to +85 °C. The focus of 850 nm pulsed laser diodes includes applications such as rangefinding, speed monitoring, laser radar, security scanners, or laser light curtains. These PLDs are also used in test and measurement systems.

Single Devices

Part Number	Wave-length [nm]	Min Power [W]	Package	Emitting Area [µm x µm]	I_{op} [A]	I_{th} [mA]
850D1S06X	850	10.5	U, S	150 x 1	12	700

! Information Specifications @ 21°C, 150 ns, 6.66 kHz • Option: C, R, Y package

905 nm
Pulsed Laser Diodes

Our 905 nm PLDs are available as single chip, stacked or multi-junction devices.

Generic Specifications at 21°C

	Min.	Typ.	Max.
Wavelength [nm]	895	905	915
Spectral bandwidth [nm]		5 (8*)	
Temperature coefficient [nm/°C]		0.27	
Beam spread (FWHM)			
Parallel to junction plane [degrees]		12	
Perpendicular			
Single elements [degrees]		25 (20*)	
Stacks [degrees]		30 (20*)	
Reverse voltage [V]			6
Pulse duration			
Single element [µs]			1 (0.15*)
Stacks [ns]			200
Duty factor [%]			0.1
Temperature			
Storage [°C]	-55		100
Operating [°C]	-45		85

* For multi-junction devices

Single and Stacked Devices

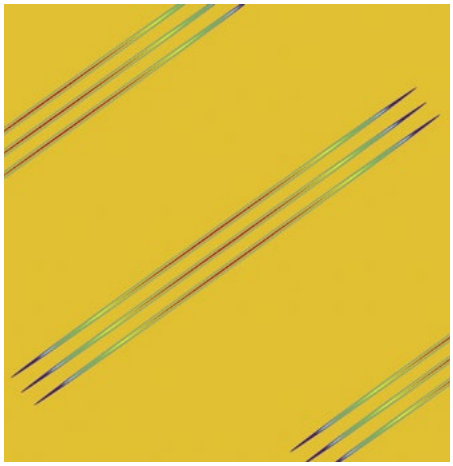
The proven AlGaAs-based design of the 905 series features unrivalled reliability, beam parameters and temperature stability, with output powers of up to 34 W (single chip) or 130 W (stack) with 150 ns pulses at 0.1 % duty cycle, thanks to the high efficiency of the design (1 W/A).

All versions are available in a range of packages including TO-18, 5.6 mm, 9 mm, 8-32 coax and chip-on-ceramic.

Single and Stacked Devices

Part Number	Min Power [W]	Package	Emitting Area [µm x µm]	I_{op} [A]	I_{th} [mA]
905D1S1.5X	3	U,S	37.5 x 1	3.5	100
905D1S03X	6	U,S	75 x 1	7	200
905D1S06X	13	U,S	150 x 1	15	400
905D1S09X	19	U,S	230 x 1	22	600
905D1S12X	26	U,S	300 x 1	30	800
905D1S16X	34	U,S	400 x 1	40	1200
905D2S06X	25	U,S	150 x 125	15	400
905D3S09X	55	U,S	230 x 225	22	600
905D3S12X	70	U,S	300 x 225	30	800
905D4S12X	90	U,S	300 x 340	30	800
905D4S16X	130	U,S	400 x 340	40	1200

! Information Specifications @ 21°C, 150 ns, 6.66 kHz • Option: C, R, Y package



Multi-junction PLDs

Multi-junction pulsed laser diodes are similar to nanostack technology.
LASER COMPONENTS' PLDs exhibit a peak power of up to 650 W at a pulse length of 150 ns from a small, compact TO-18 package.

Multi-junction Devices

Part Number	Min Power [W]	Package	Emitting Area [µm x µm]	I_{op} [A]	I_{th} [mA]
905D1S3J03X	25	U,S	85 x 10	11	300
905D1S3J06X	50	U,S	160 x 10	22	500
905D1S3J09X	75	U,S	235 x 10	35	800
905D2S3J09X	135	U,S	235 x 200	35	800
905D3S3J09X	200	S	235 x 400	35	800
905D1S3J08X	65	U,S	200 x 10	30	750
905D2S3J08X	130	U,S	200 x 110	30	750
905D3S3J08X	195	U,S	200 x 220	30	750
905D4S3J08X	260	S	200 x 330	30	750
905D5S3J08X	325	S	200 x 440	30	750
905D4S2L3J08X	520	S	800 x 330	60	1500
905D5S2L3J08X	650	S	800 x 440	60	1500

! Information Specifications @ 21°C, 150 ns, 6.66 kHz • Option: C, R, Y package

Low Cost Series

The high-volume/low-cost series consists of pulsed laser diodes in a metal housing that are best suited for consumer products such as laser rangefinders.

The 905DxxUA series features a center wavelength of 905 nm. The devices offered include single chip devices with powers ranging from 6 W to 19 W as well as multi-junction versions from 25 W to 75 W (150 ns, 0.1% duty cycle).

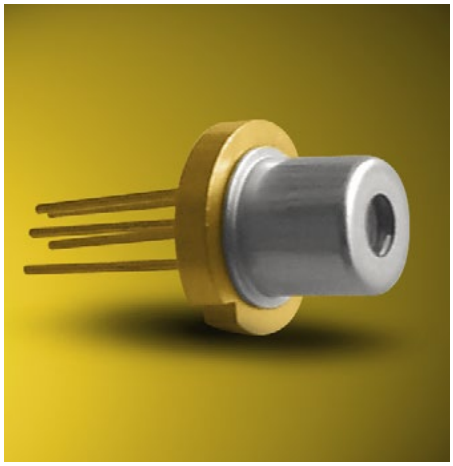
The high production volume of these devices enables LASER COMPONENTS to offer these high-quality PLDs in hermetic metal packages, at prices competitive to those offered in plastic housings.

The hermetic 5.6 mm package allows the user to benefit from the many technical advantages of the 905DxxUA series, including excellent reliability, unrivalled overdrive capability, optimum heat handling and a precise chip-to-package alignment.

Low Cost PLDs

Part Number	Wavelength [nm]	Min Power [W]	Package	Emitting Area [µm x µm]	I_{op} [A]	I_{th} [mA]
905D1S03UA	905	6	UA	75 x 1	7	200
905D1S09UA	905	19	UA	230 x 1	22	600
905D1S3J03UA	905	25	UA	85 x 10	11	300
905D1S3J06UA*	905	50	UA	160 x 10	22	500
905D1S3J09UA	905	75	UA	235 x 10	35	800
905D1S3J12UA*	905	110	UA	310 x 10	45	1000

For generic specifications please refer to the table on page 22. * available on request

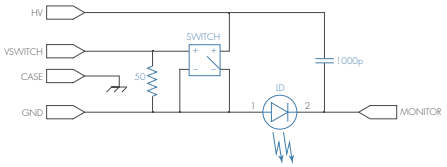


Fastest Hybrid Pulsed Laser Diode Worldwide with 2.5 ns pulse width

QuickSwitch® QS-905 Series

Ultra compact module containing a high current switch, charge storage capacitor and pulsed laser diode inside a small package. The high current loop is all internal to the package which provides EMI shielding when the switch is active. The package has an independent ground pin from the signal and supply returns.

Electronic Schematic QS-905

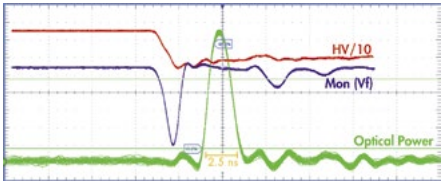


! Evaluation Board available

Generic Characteristics at t_{RT}= 21°C, I_{FM}

	Min	Typ	Max
Wavelength of peak radiant intensity λ m [nm]	895	905	915
Spectral bandwidth Δλ at 50% intensity points [nm]		8	
Wavelength temperature coefficient [nm/°C]		0.27	
Beam spread (50% peak intensity)			
Parallel to junction plane ∥ [°]		12	
Perpendicular to junction plane ⊥ [°]		20	

Performance Plot QS-905



Typical Product Characteristics

	P_o at HV (Typ.) [W]	Pulse width (Typ.) [ns]	Emitting area [µm x µm]
QS905D1S3J03U	36	2.5	75 x 10
QS905D1S3J09U	87	2.5	230 x 10

Conditions are t_{RT} = 21 °C, p_w (trig) = 40 ns, P_{rr} = 10 kHz

QuickSwitch® Evaluation Board

This is the evaluation board for the QS-905 pulsed laser diode. The board has an internal short pulse generator, allowing direct drive from a squarewave generator. The board has a socket for easy QS-905 installation.

Specifications for QS01-Eval

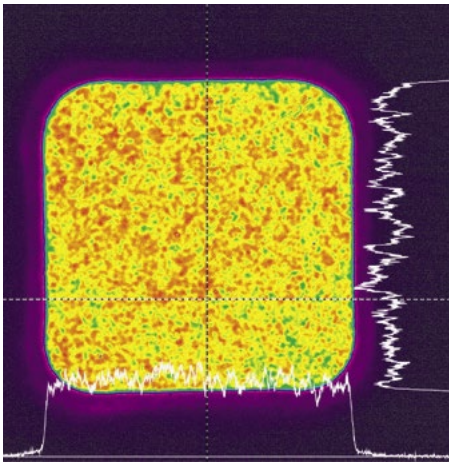
I_{HV} HV = 50 V quietscent (Vswitch = 0) [µA]	<3
I_{HV} HV=50 V, V_{TRIG}= 200 KHz square wave [mA]	13
V+ [V]	5.7 +/- 0.2
I_{V+} Quiescent [mA]	4
I_{V+} 200 kHz [mA]	5
$V_{TrigLOW}$ [V]	<0.8
$V_{TrigHIGH}$ [V]	2.0<V<3.3
R_{Trig} Internal Termination [Ohms]	50
$FWHM_{VMON}$ JP1(Horz. shorts), 50 Ω, Neg. pulse [ns]	3
$FWHM_{VMON}$ JP1(Vert. shorts), 50 Ω, Neg. pulse [ns]	700
T_D turn on delay (Trig to laser pulse) [ns]	15 typ
P_D Quiescent [W]	0.04
P_D 200 kHz [W]	0.6

SQF Series

Pulsed Laser Diodes with Homogenized Beam

Pulsed laser diodes are becoming more efficient and powerful. This makes them a real alternative to expensive and large laser systems. One advantage of the solid state laser is the very good beam profile. Here semiconductor lasers require external beam shaping elements or homogenizers. Optional diffusing discs, diffractive elements or long light waveguides, with all variants losing power or the mechanical effort is very high.

We have combined the powerful, multi-junction PLDs with a special fiber structure. Already after 15 mm a clearly homogeneous beam profile can be seen (see opposite figure). The design is compact and robust with simultaneously low losses and thus high peak power. The standard version 905D1S3J06SQF-14-15 provides a homogeneous beam from a 140 x 140 µm emitter area with a peak power of min. 25 W. Customized variants are available upon request. Of course this option can also be offered with our proven 1550 nm PLDs.



Typ. near field emission after 15 mm
(2D view)

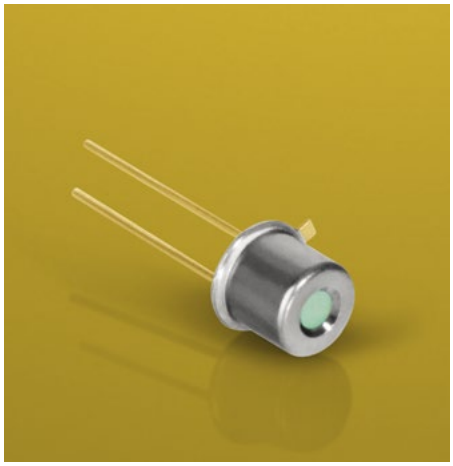
Generic Characteristics at t_{RT}= 21°C, I_{FM}

	Min	Typ	Max
Wavelength of peak radiant intensity λ m [nm]	895	905	915
Spectral bandwidth Δλ at 50% intensity points [nm]		8	
Wavelength temperature coefficient [nm]/°C		0.27	

Multi Junction Chip

	Integrated Pulsed Laser Diode	P_o ex Fiber @ i_{FM} (typ.) [W]	Emitting Area [µm x µm]	Divergence NA	Max Peak Forward Current i_{FM} [A]	I_{th} typ [mA]	Forward Voltage @ I max [V]
905D1S3J06-SQF-14-15	905D1S3J06R	25	140 x 140	0.22	22	500	11

Single chip characteristics at t_{RT} = 21°C, t_w = 150 ns, P_{rr} = 6.66 kHz



FAC Series

905 nm High Power Pulsed Laser Diodes with Fast Axis Collimators

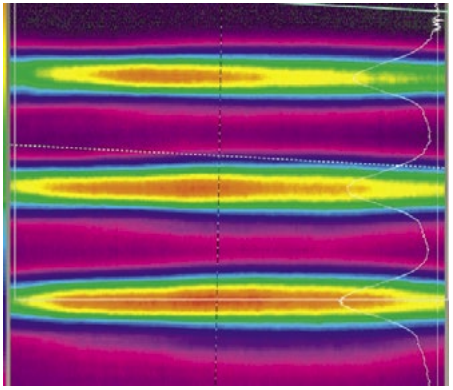
We have combined our multi-junction PLD with a fast axis collimator lens (FAC lens) mounted directly in front of the laser diode chip inside the hermetic TO-18 can.

A divergence of 36 mrad can be achieved by a triple junction laser with peak power of up to 65 W. The compact design can save engineering costs and allow for more compact laser range finder design. The design can withstand high acceleration rates of over 1500 g/ms and high temperature of up to +80 °C.

Typical Product Characteristics

	P_o @ I_{FM} (min.) [W]	Emitting Area [µm x µm]	Max. Current I_{FM} [A]	Threshold, I_{TH} [mA]	Forward Voltage @ I_{FM} [V]
905D1S3J03X	23	85 x 10	11	300	12
905D1S3J06X	45	160 x 10	22	500	11
905D1S3J09X	65	235 x 10	30	800	11

Conditions are t_{RT}= 21°C, t_w= 150 ns, P_{rr}= 3.33 kHz



Near field

Optical Characteristics at t_{RT}= 21°C, I_{FM}

	Min	Typ	Max
Wavelength of peak radiant intensity λ m [nm]	895	905	915
Spectral bandwidth Δλ at 50% intensity points at i_{FM} [nm]		8	
Wavelength temperature coefficient [nm/°C]		0.27	
Divergence, w.r.t. junction plane			
Parallel, ∥ [°]		12	
Perpendicular, ⊥ with 590µm EFL lens [mrad]			36

Absolute Maximum Ratings

	Maximun Ratings
Peak forward current (I_{FM}) [A]	50
Peak reverse voltage [V]	6
Pulse duration [ns]	150
Duty factor [%]	0.10
Temperature [°C]	
Storage	-55 to + 100
Operating	-45 to + 85
Lead soldering [°C]	
5 seconds max @	200

1550 nm
Pulsed Laser Diodes

1550 pulsed laser diodes are classified as eye-safe and are available as single or stacked devices.

Generic Specifications at 21°C • Single and Stacked Devices

	Min.	Typ.	Max.
Wavelength [nm]	1520	1550	1580
Spectral bandwidth [nm]		20	
Temperature coefficient [nm/°C]		0.5	
Beam spread (FWHM)			
Parallel to junction plane [degrees]		12	
Perpendicular			
Single element [degrees]		30	
Stacks [degrees]		30	
Reverse voltage [V]			2
Pulse duration			
Single element [ns]			200
Stacks [ns]			150
Duty factor [%]			0.1
Temperature [°C]			
Storage	-55		100
Operating	-45		85

Single and Stacked Devices

The innovative InGaAsP-based design of the 1550 series features unrivalled reliability, beam parameters and temperature stability. 0.35 W/A efficiency translates to output powers of up to 12 W (single chip) or 40 W (stack) with 150 ns pulses at 0.1 % duty cycle.

Single and Stacked Devices

Part Number	Wavelength [nm]	Min Power [W]	Package	Emitting Area [µm x µm]	I_{op} [A]	I_{th} [mA]
155G1S06X*	1550	5	S	150 x 1	20	0.8
155G1S14X	1550	12	S	350 x 1	40	1.9
155G2S06X*	1550	10	S	150 x 150	20	0.8
155G4S14X	1550	40	S	350 x 340	40	1.9

! Information Specifications @ 21°C, 150 ns, 6.66 kHz • Option: C, R, U, Y package

* Products are available on request.

HI Series

Our high intensity PLDs feature an efficiency of 0.5 W/A with a divergence of only 25 x 12 degrees and are offered as single chip devices with power up to 30 W. Packages offered include TO-18, 5.6 mm, 9 mm, and chip-on ceramic.

High Intensity Devices

Part Number	Wavelength [nm]	Min Power [W]	Package	Emitting Area [µm x µm]	I_{op} [A]	I_{th} [mA]
HI155G1S02X	1550	8	S	50 x 1	16	0.3
HI155G1S04X	1550	16	S	100 x 1	26	0.6
HI155G1S07X	1550	20	S	180 x 1	35	0.9
HI155G1S14X*	1550	30	S	350 x 1	70	2

! Information Specifications @ 21°C, 150 ns, 3.33 kHz • Option: C, R, U, Y package

* Product available on request.

Generic Specifications at 21°C • High Intensity Devices

	Min.	Typ.	Max.
Wavelength [nm]	1540	1555	1580
Spectral bandwidth [nm]		25	
Temperature coefficient [nm/°C]		0.6	
Beam spread (FWHM) [deegrees]			
Parallel to junction plane		12	
Perpendicular		25	
Reverse voltage [V]			6
Pulse duration [ns]			150
Duty factor [%]			0.1
Temperature [°C]			
Storage	-55		100
Operating	-45		85

HI-FAC Series

We have combined the high performance HI series with a fast axis collimator lens (FAC lens) mounted directly in front of the laser diode chip inside the hermetic TO-18 can.

Divergences of 5 mrad can be achieved depending on the lens used resulting in 12 degree x 5 mrad divergence which can save engineering costs and allow for more compact range finder design. Other options are 9.5 mrad or 15 mrad.

The design can withstand high acceleration rates of over 1500 g/ms and high temperatures of up to + 80 °C.

High Intensity Devices

Part Number	Wavelength [nm]	Min Power [W]	Package	Emitting Area [µm x µm]	I_{op} [A]	I_{th} [mA]
HI155G1S04SCX*	1550	10	S + FAC	100 x 1	26	0.6
HI155G1S07SCX	1550	17	S + FAC	180 x 1	35	0.9
HI155G1S14SCX**	1550	33	S + FAC	350 x 1	70	2

* Various lens options are available on request.

** Product available on request.

Generic Specifications at 21°C • High Intensity Devices

	Min.	Typ.	Max.
Wavelength of peak radiant intensity λ [nm]	1520	1550	1580
Spectral width Δλ at 50% intensity points at i_{FM} [nm]		19.5	
Wavelength temperature coefficient [nm/°C]		0.5	
Divergence, w.r.t. junction plane			
Parallel [degrees]		12	
Perpendicular, ⊥ with 150 µm EFL lens [mrad]		15	
Perpendicular, ⊥ with 275 µm EFL lens [mrad]		9.5	
Perpendicular, ⊥ with 590 µm EFL lens [mrad]		5	
Perpendicular, ⊥ with 750 µm EFL lens [mrad]		3.8	
Reverse voltage [V]			6
Pulse duration [ns]			150
Duty factor [%]			0.1
Temperature [°C]			
Storage			100
Operating			85

Fiber Pigtailed
Pulsed Laser Diodes

Fiber Pigtailed 905 nm PLDs

A near homogeneous beam distribution can be achieved by mixing the modes in an optical fiber. These PLDs have an optical output power of up to 65 W. They are, therefore, ideally suited for medical applications, laser rangefinder or illumination in which a high amount of peak power must be delivered to a point as efficiently as possible.

Multi-junction Chips and Stacked Arrays

Parameter	Integrated Pulsed Laser Diode	Po ex Fiber at I_{FM} (min.) [W]	Fiber Core / Cladding Diameter [µm / µm]	Fiber NA	Max. Peak Forward Current I_{FM} [A]	I_{th} (typ) [mA]
905D1S3J03FP-10/22-F-0-01	905D1S3J03R	12	105/125	0.22	11	300
905D1S3J09FP-40/22-F-0-01	905D1S3J09R	35	400/440	0.22	35	800
905D2S3J09FP-40/22-F-0-01	905D2S3J09R	65	400/440	0.22	35	800

! Information: Single chip characteristics @ t_{RT}= 21°C, t_W= 150 ns, P_{rr}= 6.66 kHz

Fiber Pigtailed 1550 nm PLDs

An almost homogeneous beam distribution in laser diodes can be achieved by mixing the modes in an optical fiber. Therefore LASER COMPONENTS has developed pulsed laser diodes with a fiber pigtail.

The fiber pigtailed 1550 nm PLDs have an optical output power of up to 7 W ex 105 µm fiber. These PLDs are ideally suited for laser rangefinding applications or DTS (distributed temperature sensing) in which a high amount of peak power must be delivered to a point as efficiently as possible.

Fiber-pigtailed Devices

Parameter	Integrated Pulsed Laser Diode	Po ex Fiber @ I_{FM} (min.) [W]	Fiber Core / Cladding Diameter [µm / µm]	Fiber NA	Max. Peak Forward Current I_{FM} [A]	I_{th} (typ) [mA]
HI155G1S02FP-62/27-F-0-01	HI155G1S02R	4	62.5/125	0.27	20	300
HI155G1S04FP-10/22-L-0-01	HI155G1S04R	7	105/125	0.22	30	600
HI155G1S04FP-10/22-F-0-01	HI155G1S04R	5	105/125	0.22	30	600

! Information: Additional products are available on request.

Package Drawings

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