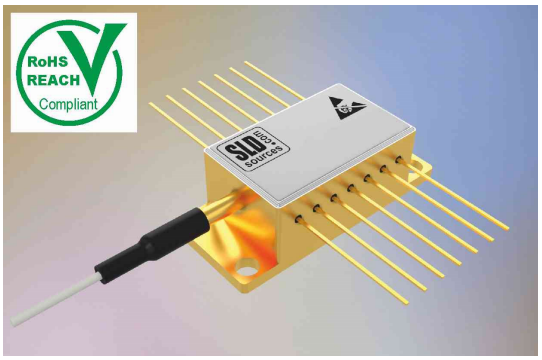
Superluminescent Diode (SLD) modules (all standard products)

Description



Superluminescent Diodes (SLDs) are used in various applications requiring high-power, spatially-coherent, wide-spectrum light sources. The unique characteristic of superluminescent diodes is that they combine the features of laser diodes – such as high spatial coherence and high brightness – with the very wide spectrum inherent to light-emitting diodes. The output emission is the amplified spontaneous emission of laser diode epi-structures in which lasing is suppressed by special measures.

These are light sources of choice for many disruptive technologies: optical coherence tomography, low-coherence interferometry, distributed Bragg grating sensing, speckle-free illumination and many others. The module design is Telcordia GR-468-CORE qualified.

This document describes the performance of standard products containing a single Superluminescent Diode (SLD) module:

- fiber-pigtailed cooled SLD modules;
- free-space TO9-canned uncooled SLD- modules.

If you need more detailed specifications for any part number (P/N) in the tables below, or if you need customized specifications, please contact us at enquiries@sldsources.com.

Features

- Wide range of products in the 670 — 1600 nm spectral range
- optimized combination of optical power and spectral width
- SMF, PMF, MMF fiber output, or free-space output
- wide selection of module packages, cooled and uncooled, including standard hermetically sealed Butterfly package
- low relative intensity noise, < −135 dB/Hz
- easy customization to meet specific requirements

Applications

- optical coherence tomography
- white light interferometry
- spectroscopy
- low-speckle illumination
- testing of optical components
- fiber optic gyroscopes

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Standard fiber-pigtailed cooled SLD modules (660 – 1200 nm spectral range)

(FC/APC terminated fiber pigtail with 900 µm loose tube; hermetically sealed Butterfly package with Peltier TEC, 10 kOhm thermistor, and PD monitor)

Product P/N [1]	Fiber optical power, mW	Central wavelength, nm	Spectral FWHM (–3dB width), nm	SLD current Typ / Max, mA	Spectral ripple Typ / Max, % *(@ 0.01nm spectral resolution)*	Type of spectrum[2]
Products for medical Optical Coherence Tomography (OCT)						
optical performance specifically optimized for TD and SD OCT						
SLD670B8P10	10	670 ± 10	8 ± 1.5	140 / 180	1 / 5	Bell-like
SLD785F50P15	15 ± 5	785 ± 10	50 ± 10	250 / 350	1 / 5	Flat-top (two humps)
SLD830F60P15	15 ± 5	830 ± 10	60 ± 5	250 /350	1 / 5	Flat-top (two humps)
SLD830F75P15	15 ± 5	830 ± 10	75 ± 10	300 / 400	1 / 5	Flat-top (two humps)
SLD840F50P8	8 ± 3	840 ± 10	50 ± 5	200 / 250	1 / 5	Flat-top (two humps)
SLD840F50P15	15 ± 5	840 ± 10	50 ± 5	250 / 300	1 / 5	Flat-top (two humps)
SLD840F50P25	25 ± 5	840 ± 10	50 ± 5	300 / 400	1 / 5	Flat-top (two humps)
SLD840B30P10	10	840 ± 10	30 ± 5	250 / 300	1 / 5	Bell-like
SLD840B30P20	20	840 ± 10	30 ± 5	250 / 300	1 / 5	Bell-like
SLD1010F100P7	7 ± 2	1010 ± 10	100 ± 10	280 / 350	1 / 5	Flat-top (two humps)
SLD1055F70P10	10 ± 2	1055 ± 15	70 ± 10	220 / 280	1 / 5	Flat-top (two humps)
Unique optical performance						
outstanding, most optically powerful and most spectrally broad performance						
SLD795B15P30	30	795 ± 5	15 ± 3	250 / 350	1 / 5	Bell-like
SLD840B25P50	50	840 ± 10	25 ± 5	350 / 450	1 / 5	Bell-like
SLD840F50P50	50 ± 5	840 ± 10	50 ± 5	450 / 550	1 / 5	Flat-top (two humps)
SLD935F100P12	12 ± 3	935 ± 10	100 ± 10	250 / 400	1 / 5	Flat-top (two humps)
SLD1185B30P1	1	1185 ± 10	30 ± 5	550 / 650	1 / 5	Bell-like
Other part numbers						
Most standard products are listed. Much more customized products are available.						
Please contact us at enquiries@sldsources.com with your detailed requirements						
SLD780B15P12	12	780 ± 5	15 ± 3	150 / 200	1 / 5	Bell-like
SLD840B16P10	10	840 ± 10	16 ± 3	150 / 250	1 / 5	Bell-like
SLD850B25P12	12	850 ± 5	25 ± 5	150 / 200	1 / 5	Bell-like
SLD960B35P20	20	960 ± 15	35 ± 10	250 / 300	1 / 5	Bell-like
SLD1065B35P20	20	1065 ± 10	35 ± 5	250 / 400	1 / 5	Bell-like

Standard fiber-pigtailed cooled SLD modules (1300 – 1600 nm spectral range, bell-like emission spectra[2])

(FC/APC terminated fiber pigtail with 900 µm loose tube; hermetically sealed Butterfly package with Peltier TEC, 10 kOhm thermistor, and PD monitor)

Product P/N [1]	Fiber optical power, mW	Central wavelength, nm	Spectral FWHM (–3dB width), nm	SLD current Max, mA	Spectral ripple Typ / Max, % *(@ 0.01nm spectral resolution)*
SLD1290B40P10	10	1290 ± 10	40 ± 5	350	2 / 5
SLD1300B30P20	20	1300 ± 10	30 ± 5	400	3 / 5
SLD1555B50P5	5	1555 ± 10	50 ± 5	400	2 / 5
SLD1555B25P10	10	1555 ± 10	25 ± 5	400	2 / 5
SLD1555B35P15	15	1555 ± 10	35 ± 5	500	2 / 5
SLD1555B50P15	15	1565 ± 10	50 ± 5	550	2 / 5
SLD1555B40P20	20	1555 ± 10	40 ± 5	550	2 / 5
SLD1565B50P20	20	1565 ± 10	50 ± 5	650	2 / 5
SLD1565B25P20	20	1565 ± 10	25 ± 5	650	2 / 5
SLD1580B30P30	30	1580 ± 10	30 ± 5	900	2 / 5

[1] P/Ns of fiber-pigtailed SLDs indicated in the table above do not contain information on the type of fiber. The corresponding suffix must be added to the end of the P/N to specify the fiber, as follows: **S** – for isotropic SM fiber; **P** – for PANDA PM fiber; **M** – for multi-mode [MM] fiber.

[2] See examples of bell-like and flat-top spectra on the next page.

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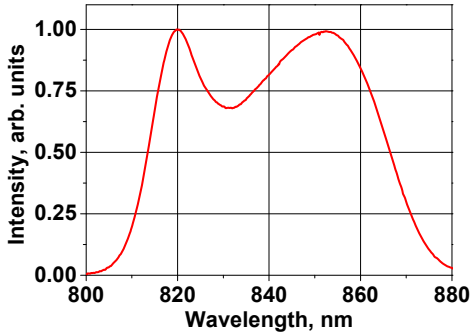
Free-space TO9-canned uncooled SLD modules (660 – 1000 nm spectral range)

(standard TO9 package, AR-coated glass window, PD monitor)

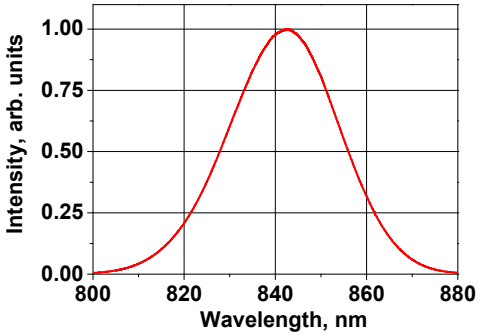
Product P/N	Fiber optical power, mW	Central wavelength, nm	Spectral FWHM (–3dB width), nm	SLD current Typ / Max, mA	Spectral ripple Typ / Max, % *(@ 0.01nm spectral resolution)*	Type of spectrum[1]
Most standard products are listed. Much more customized products are available. Please contact us at enquiries@sldsources.com with your detailed requirements						
SLD670B8P5F09	5	670 ± 10	8 ± 1.5	120 / 160	1 / 5	Bell-like
SLD670B8P15F09	15	670 ± 10	8 ± 1.5	110 / 180	1 / 5	Bell-like
SLD835B12P30F09	30	835 ± 10	12 ± 2	200 / 280	1 / 5	Bell-like
SLD840B18P20F09	20	840 ± 10	18 ± 3	140 / 180	1 / 5	Bell-like
SLD845B30P100F09	100	845 ± 10	30 ± 10	350 / 450	1 / 5	Bell-like
SLD880B40P20F09	20	880 ± 10	40 ± 10	200 / 260	1 / 5	Bell-like
SLD920B30P20F09	20	920 ± 10	30 ± 5	150 / 200	1 / 5	Bell-like
SLD970B30P8F09	8	970 ± 10	30 ± 5	120 / 150	1 / 5	Bell-like

[1] Examples of bell-like and flat-top spectra are shown below.

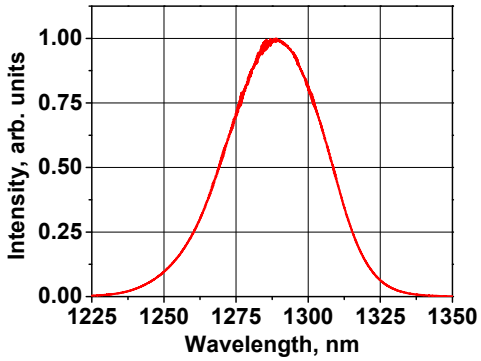
Flat-top (two humps) spectrum example (840 nm)



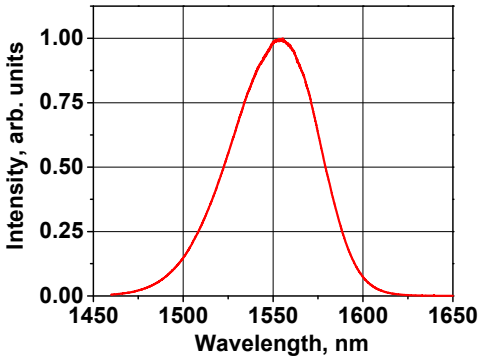
Bell-like spectrum example (840 nm)



Bell-like spectrum example (1300 nm)



Bell-like spectrum example (1550 nm)



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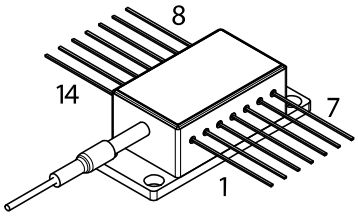
Product customization

We are capable to customize our products to meet any specific requirements:

- ***optical performance specifications.*** Various SLD products at wavelengths of 660 nm, 780 nm, 805 nm, 810 nm, 850 nm, 860 nm, 870 nm, 920 nm, 980 nm, 1000 nm, 1050 nm, and in the 1300 – 1600 nm spectral range are available.
- ***module package.*** The module packages available can be found below.



Standard Butterfly package
(FC/APC terminated fiber pigtail with 900 µm loose tube; standard package with Peltier TEC, 10 kOhm thermistor, PD monitor)

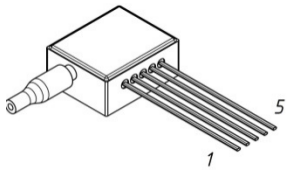
30 × 12.7 × 9.8 mm (L × W × H)

1	TEC Anode (+)
2	Thermistor
3	PD Anode (-)
4	PD Cathode (+)
5	Thermistor
6	N/C
7	N/C
8	N/C
9	N/C
10	SLD Anode (+)
11	SLD Cathode (-)
12	N/C
13	Case
14	TEC Cathode (-)

Free-space uncooled TO9 and TO56 canned packages
(standard package, AR-coated glass window, PD monitor)

⌀9 × 6.7 mm (D × H)
⌀5.6 × 3.6 mm (D × H)

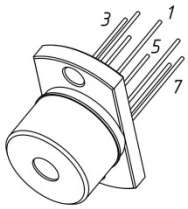
1	SLD Anode (+)
2	Common, Case
3	PD Cathode (+)



Uncooled fiber-pigtailed MiniButterfly package
(bare 250 µm optical fiber output package with thermistor and PD monitor)

14.8 × 8.5 × 4.5 mm
(L × W × H)

1	Thermistor
2	Thermistor
3	SLD Anode (+)
4	SLD Cathode (-) PD Anode (-) Case
5	PD Cathode (+)



Peltier-cooled free-space package [TOW]
(*AR-coated glass window,Peltier TEC, 10 kOhm thermistor, PD monitor)*

22.9 × 12.7 × 11.3 mm
(L × W × H)

1	PD Anode (-) Case
2	SLD Cathode (-)
3	TEC Cathode (-)
4	TEC Anode (+)
5	SLD Anode (+)
6	Thermistor
7	Thermistor
8	PD Cathode (+)

- ***optical fiber.*** The standard fibers available can be found below.

SM and PM fibers:

Spectral range	Single-mode (SM) isotropic fiber	Polarization maintain (PM) fiber
650 – 700 nm	FiberCore SM600	Corning PANDA PM63-U25D
750 – 1000 nm	Corning HI780	Corning PANDA PM85-U25D
1000 – 1200 nm	Corning HI1060	Corning PANDA PM98-U25D
1300 – 1600 nm	Corning SMF-28	Corning PANDA PM13-U25A

MM fibers: Corning 50/125/250 µm, Corning 62.5/125/250 µm, ThorLabs GIF 625-100.