



# BDS-SM

## BDS-SM Family Picosecond Diode Lasers

Small-size OEM Module, 40 mm x 40 mm x 120 mm

Wavelengths 375 nm, 405 nm, 445 nm, 473 nm, 488 nm, 515 nm, 640 nm, 685 nm, 785 nm, 1064 nm

Free-beam or single-mode fibre output

Pulse width down to < 40 ps

Pulse repetition rate 20 MHz, 50 MHz, and CW mode

Power in pulsed mode up to 5 mW

Power in CW mode up to 50 mW

Fast on / off / multiplexing capability

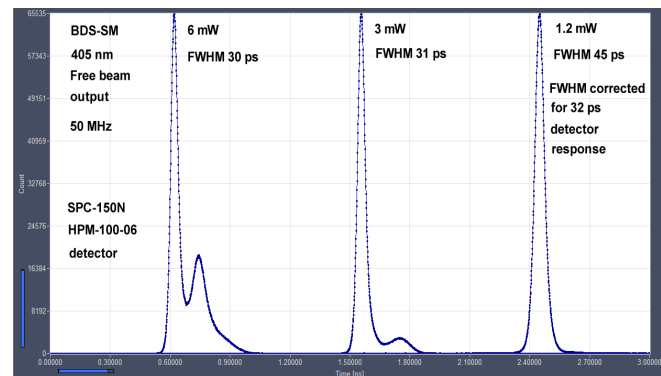
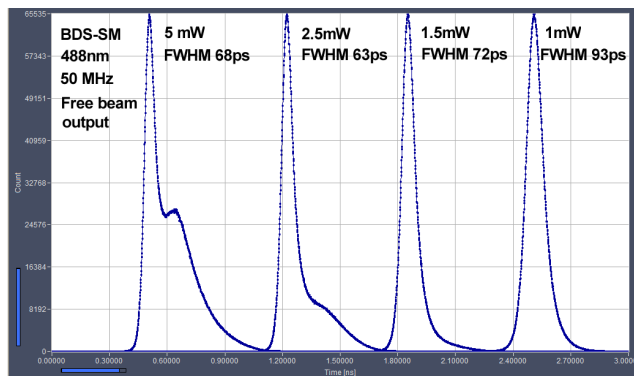
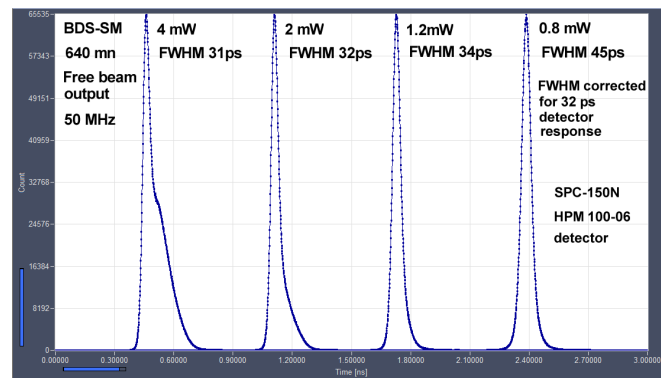
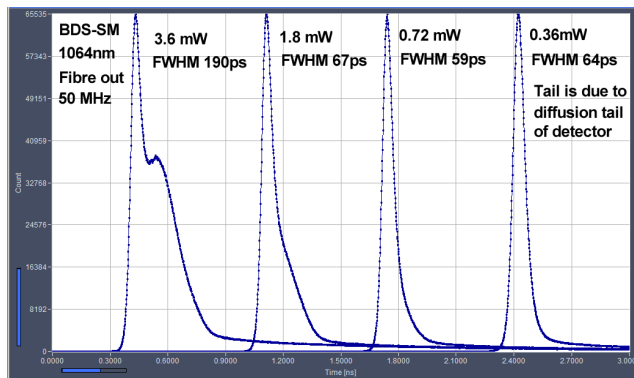
Internal power stabilisation loop

All electronics integrated

No external driver unit required

Simple +12 V power supply

Compatible with all bh TCSPC devices



Pulse shapes and power levels may change due to development in laser diode technology. Coupling efficiency into single-mode fibres is 40 to 60%.

Designed and manufactured by



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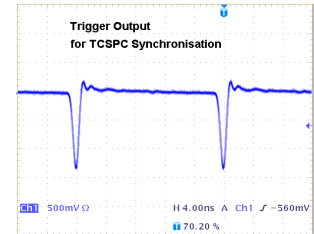
# BDS-SM

## Optical

Repetition Rate, switchable by TTL signal	20 MHz, 50 MHz and CW, other repetition rates on request
Wavelengths	375 nm, 405 nm, 445 nm, 470 nm, 485 nm, 515 nm, 640 nm, 685 nm, 785 nm, 1064 nm, other on request
Pulse width (FWHM, at medium power)	30 to 90 ps
Pulse width (FWHM, at maximum power)	60 to 300 ps
Power control range (ps mode, power in free beam)	0 to 1 mW ..... 0 to 5 mW (depends on wavelength version)
Power control range (CW mode, power in free beam)	0 to 20 mW ..... 0 to 50 mW (depends on wavelength version)
Beam diameter, free beam	0.7 mm x 1.2 mm (depends on wavelength version)
Polarisation	horizontal
Coupling efficiency into single-mode fibre, typically	40% to 60%

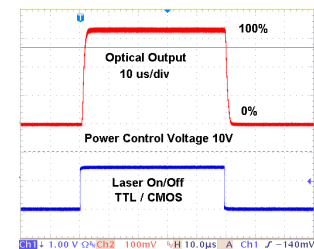
## Trigger Output, to TCSPC Modules

Pulse Amplitude	-1.2 V (peak) into 50 Ω
Pulse Width	1 ns, see figure right
Output Impedance	50 Ω
Connector	SMA
Jitter between Trigger and Optical Pulse	< 10 ps



## Synchronisation Input

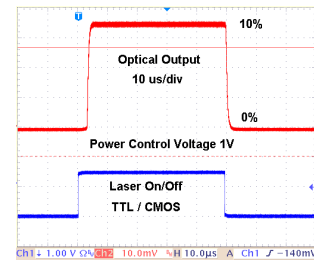
Input amplitude	+3.3 to +5V into 50 Ω
Duty cycle	10 to 30%. DC equivalent must be < 2.5V
Input frequency	20 to 60 MHz
Connector	SMA
Switch between internal clock and sync input	automatic, by average voltage at trigger connector



## Control Inputs

Laser ON / Off	TTL / CMOS, 'low' means 'off', internal pull-up
Response of optical output to on/off signal	<4 us for power 10 to 100%, see figures right
External Power Control	analog input, 0 to +10V
Response time of optical output to power control	<4 us for power 10 to 100%, see figure right
Frequency 50 MHz	active H, internal pull-up resistor
Frequency 20 MHz	active H, internal pull-down resistor
CW	active H, internal pull-down resistor

Laser runs at 50 MHz when Frequency/CW inputs unconnected



## Power Supply

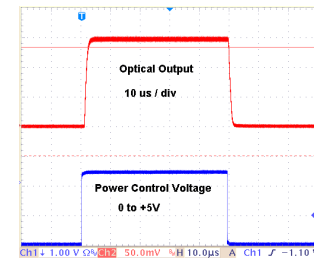
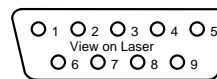
Power Supply Voltage	+9 V to +15 V
Power Supply Current at 12V	200 mA to 500 mA 1)

## Mechanical Data

Dimensions	40 mm x 44 mm x 120 mm
Mounting holes	four holes for M3 screws
Heat sink requirements	< 2°C / W 2)

## Connector Pin Assignment

Connector version	Mini Sub-D
Power supply +12V	1, 2
GND	4, 5, 9, and case
Power control voltage	8
Laser On/OFF (active H)	6
Frequency 50 MHz (active H, internal pull-up resistor)	7
Frequency 20 MHz (active H, internal pull-down resistor)	3
CW (active H, internal pull-down resistor)	9



## Maximum Values

Power Supply Voltage	0 V to +15 V
Voltage at 'Laser On/Off' and 'Frequency' inputs	-2 V to +7 V
Voltage at 'Laser Power' input	-12 V to +12 V
Ambient Temperature	0 °C to 40 °C 3)

1) Depends on case temperature due to laser diode cooling. Cooling current changes with case temperature  
 2) Laser must be mounted on heat sink. Case temperature must remain below 40°C

## Related Products

BDS-MM picosecond diode lasers, BDL-SMN picosecond and CW diode lasers, 375nm, 405nm, 445nm, 473nm, 488nm, 515nm, 640nm, 685nm, 785nm



**Caution: Class 3B laser product. Avoid direct eye exposure. Light emitted by the device may be harmful to the human eye. Please obey laser safety rules when operating the devices. Complies with US federal laser product performance standards.**

## International Sales Representatives



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