

11. Glossary

FWHM (Full Width Half Maximum)

A quantity for the description of pulse or distribution widths, in which the full width of the curve shape is taken at a height of half of the maximum.

IRF (Instrument Response Function)

The instrument response function is ideally the response of the instrument to the input of a signal consisting of a Dirac delta function. All data measured with an instrument are the convolution of the actual input signal with its IRF.

LDH, LDH-C (Laser Diode Head)

Model numbers of the PicoQuant Laser heads:

LDH: without cooling

LDH-C: with thermoelectric cooler (TEC)

LED (Light Emitting Diode)

are used here in two different functions:

1. as a simple indicator light on the front panel
2. high power LEDs inside the →PLS light sources as the emitter of sub-nanosecond pulses

PLS (Pulsed Light Source)

Model Number of the LED based sub-nanosecond pulsed light sources for the PDL 800-B from PicoQuant

PMT (Photomultiplier Tube)

Photodetector with high sensitivity, dynamics and time resolution, commonly used for →TCSPC

NIM

The NIM standard (DOE/ER-0457), originally an acronym for Nuclear Instrumentation Methods, was established in 1964 for the nuclear and high energy physics communities. The goal of NIM was to promote a system that allows for the interchangeability of modules. Even today experimenters use NIM modules to assemble a system, which meets the specific requirements of their experiment. The NIM standard also specifies three sets of logic levels. In fast-negative logic, usually referred to as NIM logic, logic levels are defined by current ranges. Since the standard also requires 50 Ohms input/output impedances, these current ranges correspond to voltages of 0 V and -0.8 V for logic 0 and 1, respectively. Fast-negative logic circuitry can provide NIM signal with rise times of order 1 nsec

(Source : <http://www-esd.fnal.gov/esd/catalog/intro/intronim.htm>)

Peltier

The basic concept behind thermoelectric coolers (→TEC) is the Peltier effect, which was discovered in 1834. The Peltier effect occurs whenever current passes through the circuit of two dissimilar conductors; depending on the current direction, the junction of the two conductors will either absorb or release heat.

SPAD (Single Photon Avalanche Diode)

Semiconductor based photodetector with single photon sensitivity.

TCSPC (Time Correlated Single Photon Counting)

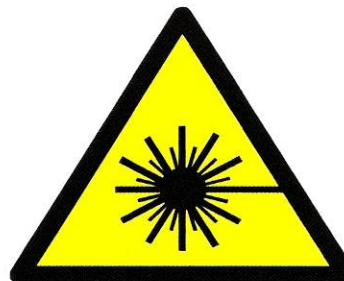
A light detection technique of high sensitivity, dynamics and time resolution that registers the arrival time of each single photon relative to a synchronisation signal from a repetitive pulsed light source. See our Tech Note on TCSPC for more details.

TEC (Thermoelectric Cooler)

Electrical cooling (or heating) device based on →Peltier elements.

A Appendix

Laser Delivery Report



LASER RADIATION AVOID DIRECT EXPOSURE TO BEAM
 CLASS 3B LASER PRODUCT
 EN 60825-1

P_o= max. 14 mW
 P_p= max. 600 mW
 t=max. 500 ps
 f=max. 80 MHz
 λ= 683 nm

Laser Head:

Model No. LDH-P-C-690
Serial No.: 1009770

- Optics:**
- Collimator
 - Fibre Coupler, FC Connector
 - Fibre Coupler, SMA Connector
 - Single Mode Fibre
 - polarisation maintaining
 - Multi Mode Fibre
 - Fibre Collimator

Wavelength: 682 nm - 683 nm

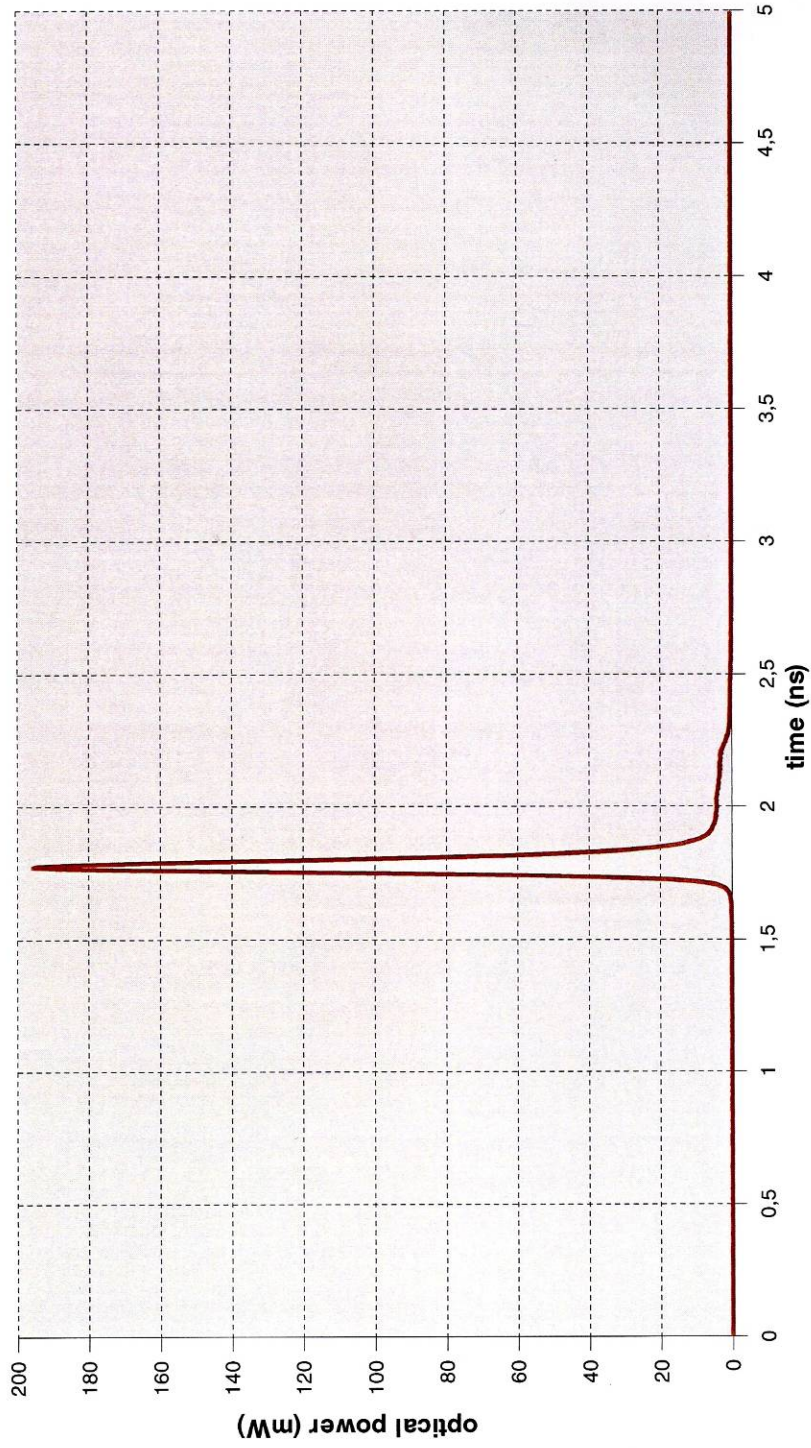
Average Optical Power:

Repetition frequency	Max. optical power (10% calibr. error)
80,0 MHz	8,6 mW
40,0 MHz	4,9 mW
20,0 MHz	2,5 mW
10,0 MHz	1,3 mW
5,0 MHz	0,59 mW
2,5 MHz	0,32 mW

Note:
 Output power is measured at shipping time at the collimator's aperture. At the end of an optional fibre you will measure lower values, due to coupling losses. The coupling efficiency is different for each laser head. Typical values are 40% for single mode and 80 % for multi mode fibres. After hundreds of operating hours the maximum output power may begin to decrease.

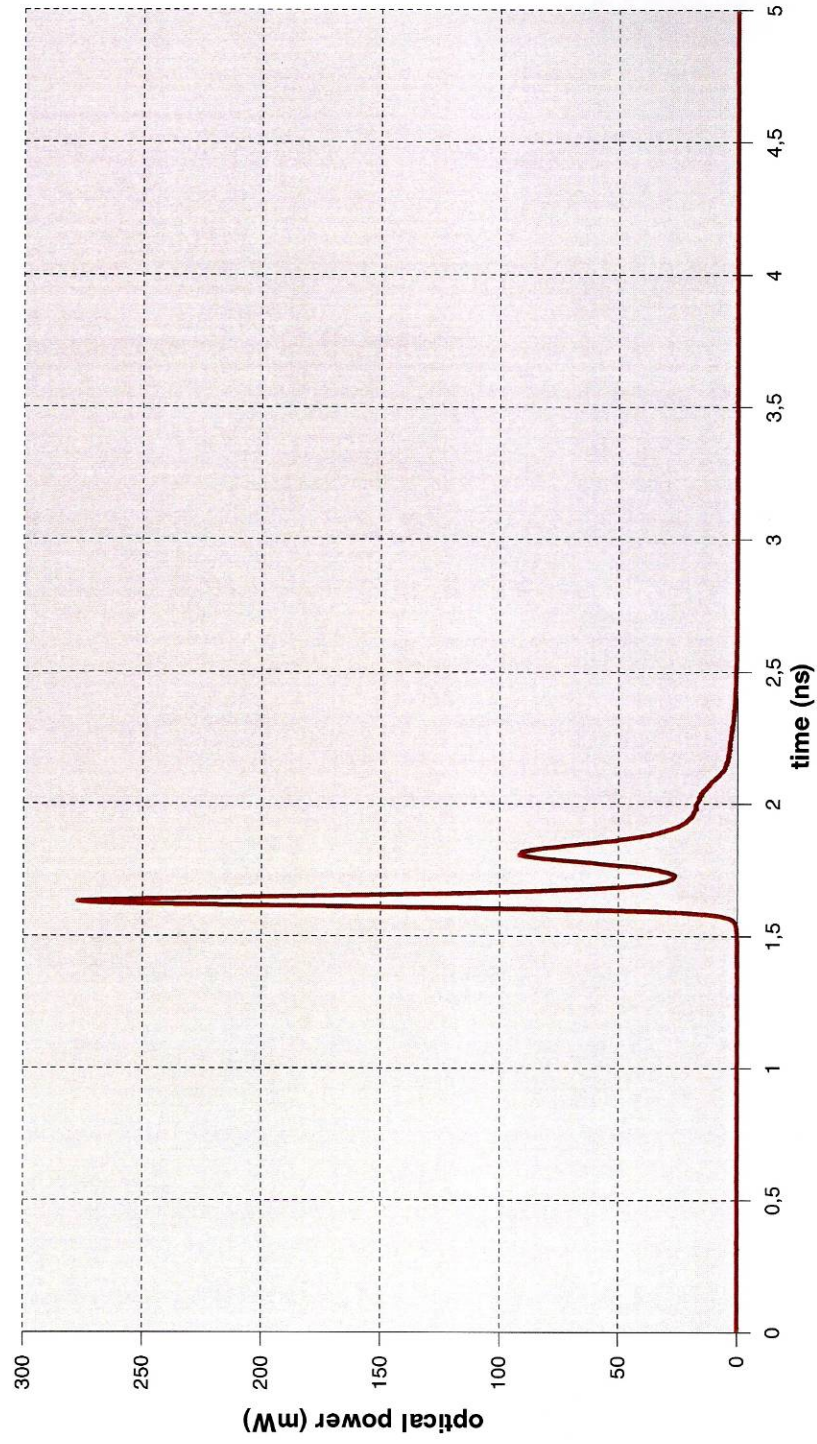
Minimum Pulse Width: 54 ps

For more data of the optical pulses see diagrams on the next pages.
 Note that all timing responses are convoluted with the Instrument Response Function (IRF) of the detection system as indicated in the curve plot. This means that the laser pulses are actually narrower than they appear here.



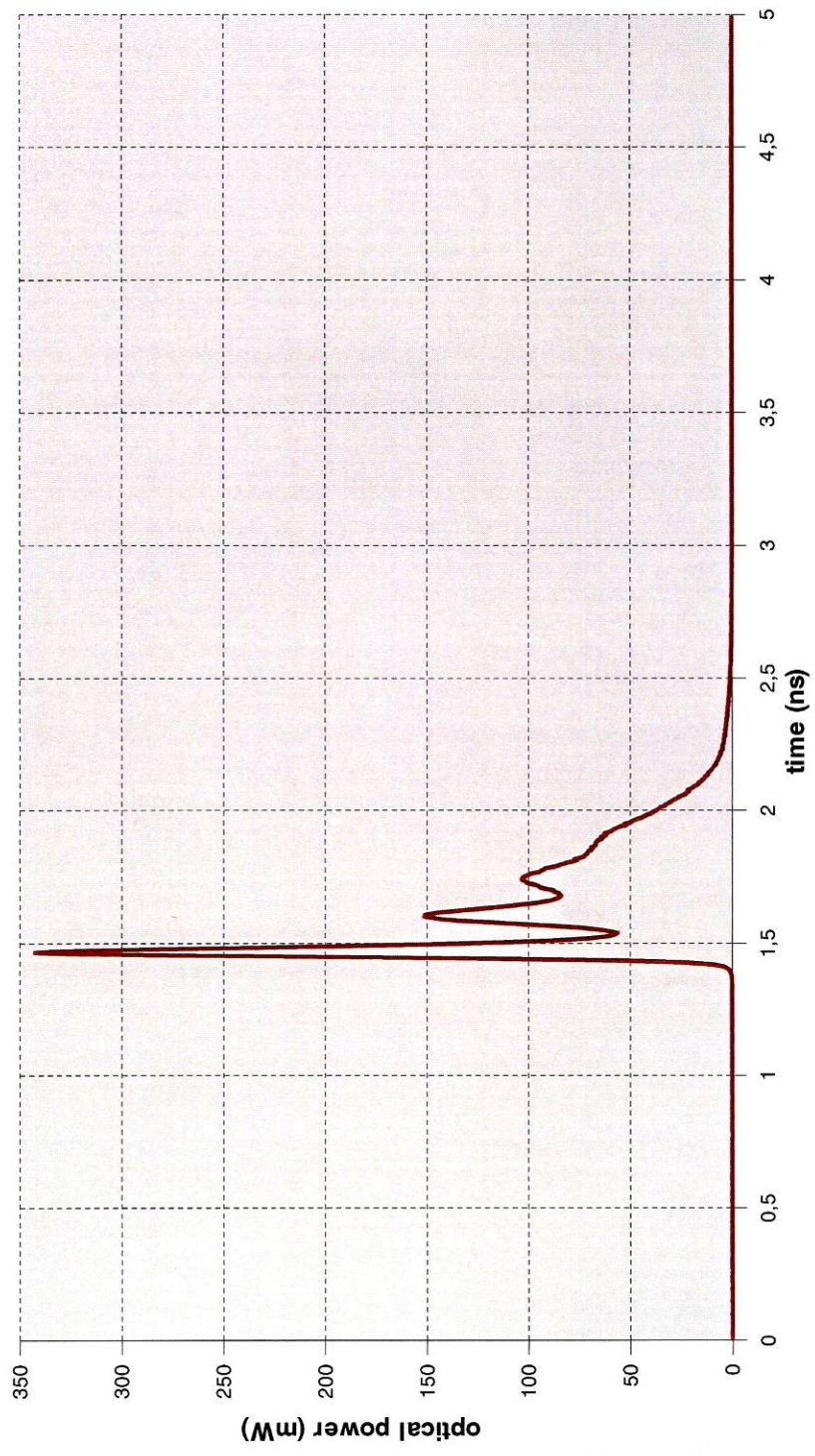
Laser Head: 1009770

PicoQuant GmbH 2009



Laser Head: 1009770

PicoQuant GmbH 2009

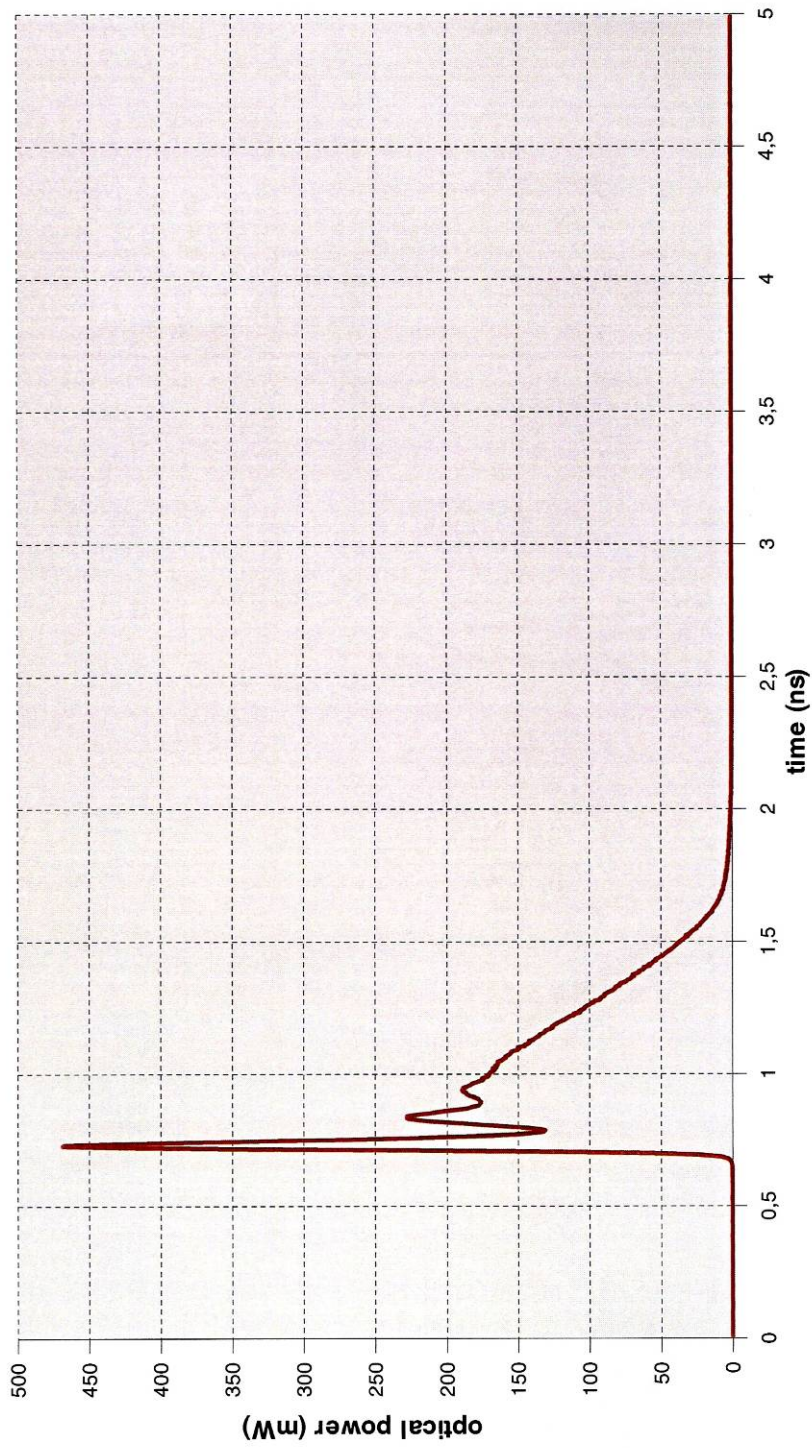


peak power 343 mW
 pulse energy: 62 pJ
 FWHM: 44 ps
 IRF: 30 ps

wavelength: 683 nm
 average power 5,0 mW
 @ rep. frequency 80 MHz

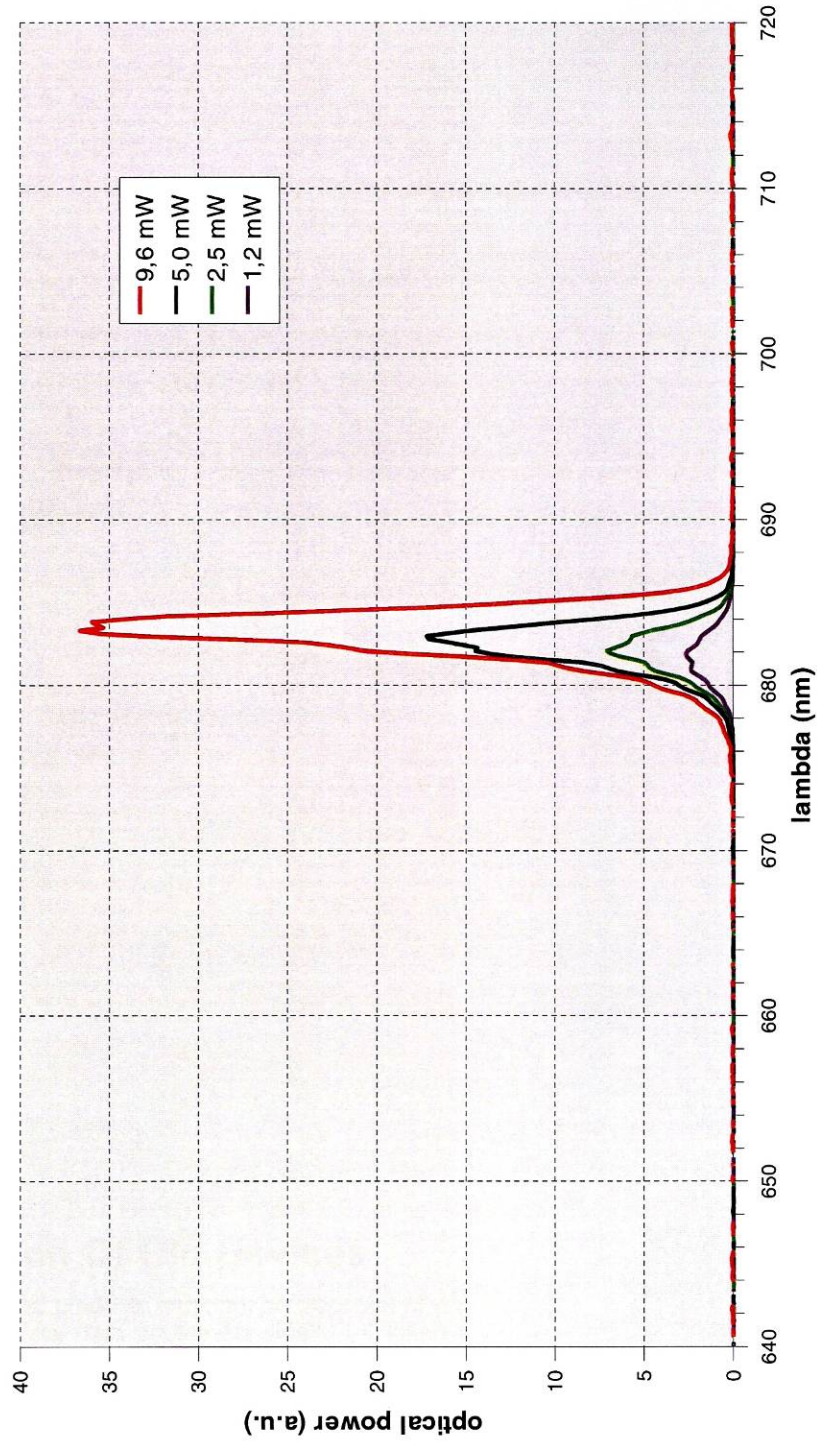
Laser Head: 1009770

PicoQuant GmbH 2009



Laser Head: 1009770 wavelength: 683 nm peak power: 468 mW
average power: 9,6 mW pulse energy: 120 pJ
@ rep. frequency: 80 MHz FWHM: 44 ps
IRF: 30 ps

PicoQuant GmbH 2009



Laser Head: 1009770 avg. wavelength: 682,5 nm min. spectral width: 2,5 nm
max. spectral width: 3,2 nm

Retraction Of Old Devices

Waste electrical products must not be disposed of with household waste. This equipment should be taken to your local recycling centre for safe treatment.



WEEE-Reg.-No. DE 96457402