

PiLas Test Report:

Date: December 18, 2012

Checked by: Dr. Bachert
B. Khoury

Item:

Characteristics:

Head
Serial number: PiL063X 602 47RIILD, T_head: 24°C at 1MHz, LED:gn, D8:open

Controller
Serial number: EIG2000DX 602 max. PRF 1MHz

Laserdiode
Chip: WT931 SP1111LD-2
Wavelength: 1056nm (measured at 1MHz)
Spectral width: 9.0nm (measured at 1MHz)

Optics
Laserdiode Collimator
Focal length: 50CL-A4.5-02 4.5mm
Numerical aperture: 0.55
Beam diameter ($1/e^2$): 3.0mm x 1.3mm @ 0.5m
Beam divergence ($1/e^2$): <0.5mrad

Fiber Coupler
Focal length: 60SMS-1-4-A11-02 (FC/APC) 11 mm
Numerical aperture: 0.25

Fiber
Index-type: P-980A-PCAPC-1
core / MFD: SI
NA: 6µm
Connectors: 0.12
FC/APC-FC/PC
Fiber Collimator PiL106FS-11
Focal length: 11 mm
Micro Focus PiL106FS-50
Focal length: 50 mm

LD TEC
Thermistor: n/a
NTC value:

Laser Class: **3R**
IEC 60825-1:2007
see manual for laser
warning label
reproduction

Test measurements:

Setup:

Warm-up time of the entire running system is 10 min, ambient temperature 25 °C.

Optical power measurement:

average power: a) HP8152A power meter + 81520A/81521B optical head (Agilent/Hewlett-Packard) b) Fieldmaster + LM2/LM1 (Coherent)
Measurement is done at the collimated free space output or at fiber end in case of fiber option.

The peak power is calculated by the ratio average power / duty cycle (as taken from the Streak camera or the MSM-photodetector results).

Spectral measurements:

Wavelength and spectral width are measured with OSA TQ8345 and FSD300 CCD spectrometer.

Dynamic measurement:

Optical setup: Collimated or fiber coupled laser light is coupled in to the 9µm fiber of a 20GHz MSM UltraFast detector.

Photodetector: 20GHz MSM UltraFast detector (A.L.S. GmbH) with 9µm fiber input and FC/PC-connector.

Oscilloscope: HP54750A + 54752B, 20 and 50 GHz channels (Hewlett-Packard/Agilent).

Streak-camera: C5680 with C4880 CCD (Hamamatsu) (measurement frequency 100kHz)

1. Frequency scan with oscilloscope, photodetector and optical power meter:

Frequency	Tune value (%)	FWHM (ps)	RMS - Jitter (ps)	Delay (ns)	after SM fiber	
					Av. power (µW)	after SM fiber Energy (pJ) Peak power (mW)
1 kHz	74	31	1.6	37.25	0.008	8 215
10 kHz	74	31	1.4	37.25	0.074	7 215
100 kHz	74	31	1.4	37.25	0.736	7 215
200 kHz	74	31	1.4	37.25	1.472	7 215
500 kHz	74	31	1.4	37.25	3.68	7 215
1 MHz	74	31	1.4	37.22	7.46	7 215

2. Tune scan with Streak camera and optical power meter at selected frequency:

Device: Streak Camera

Frequency	Tune value (%)	FWHM (ps)	relative to norm pulse	after SM fiber Av. power (µW)	after SM fiber Energy (pJ)	after SM fiber Peak power (mW)
100 kHz	85	42.7	below	0.334	3	60
100 kHz	73	29.2	norm pulse	0.736	7	215
100 kHz	54	28.5	above	1.736	17	330

3. Enclosed Views:

Pulse measurements with Streak: Rep.-rate: 100kHz: Tuning rates 85, 73 and 54% with pulse data.
Pulse measurements with Oscilloscope and photodetector: Rep.-rate: 1MHz, 73%. Time base 20ps.
Jitter measurements with Oscilloscope and photodetector: Rep.-rate: 1MHz, 73%. Time base 20ps.

4. Remarks:

TUNE values can be changed if TUNE mode is set to "manual" only. Try to find TUNE value near the automatic one if pulse is not at optimum.
After switching the frequency some time is required for power stabilization.
For higher frequencies we recommend mounting the laser head on a metal platform for additional cooling.
For external triggering start with TTL Trigger input. If no triggering is possible use +5/-5V Trigger input and modify trigger threshold.
For external triggering the corresponding trigger mode must be enabled (ext. TTL or ext. Adj.)
The average power at external triggering should correspond to average power at nearest internal frequency.
Do not apply higher frequencies than maximum ordered one (see purchase information).

Time base

Scale

20.0 ps/div

Position

37.2450 ns

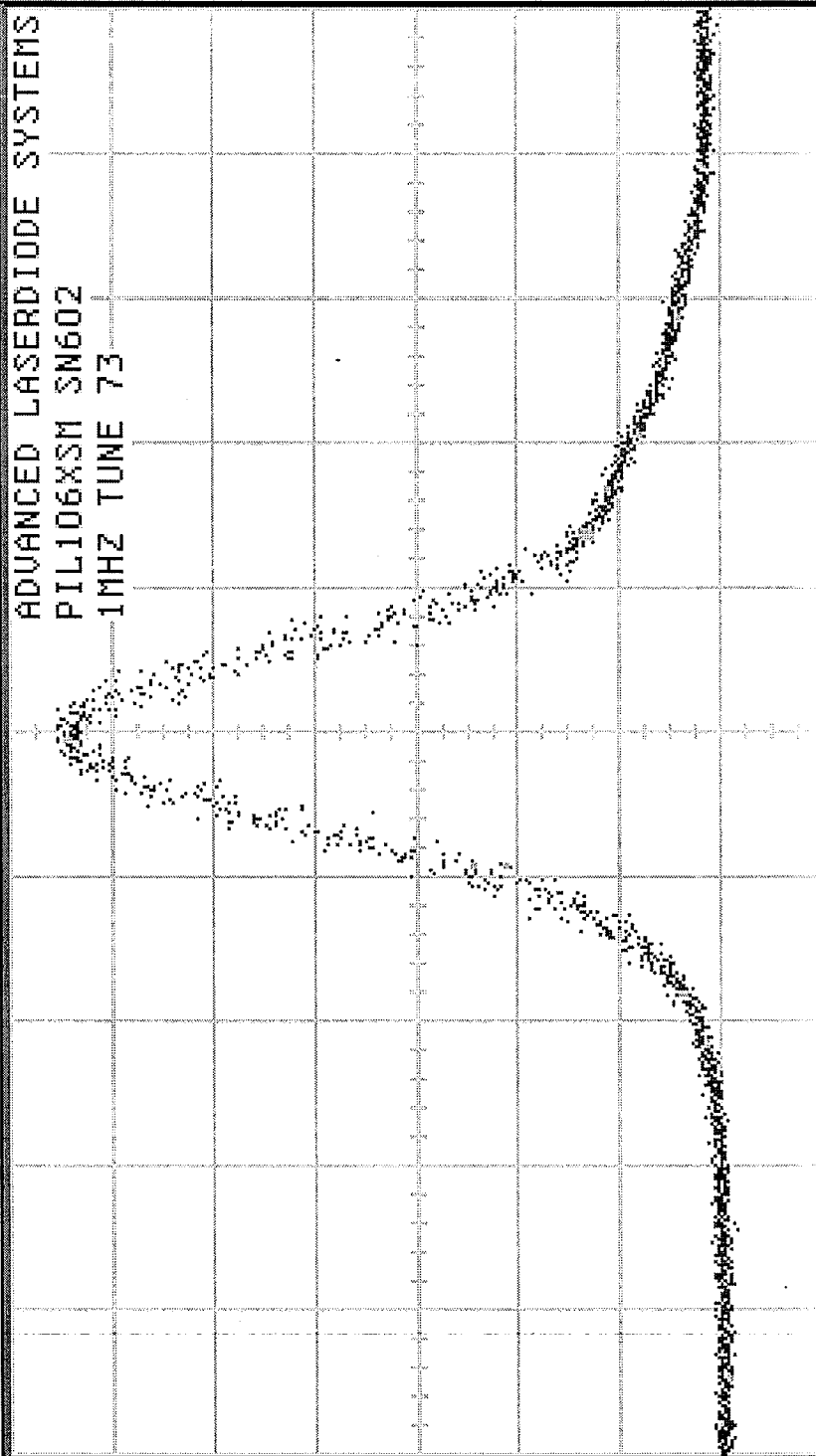
Reference

left center

Windowing

disabled enabled

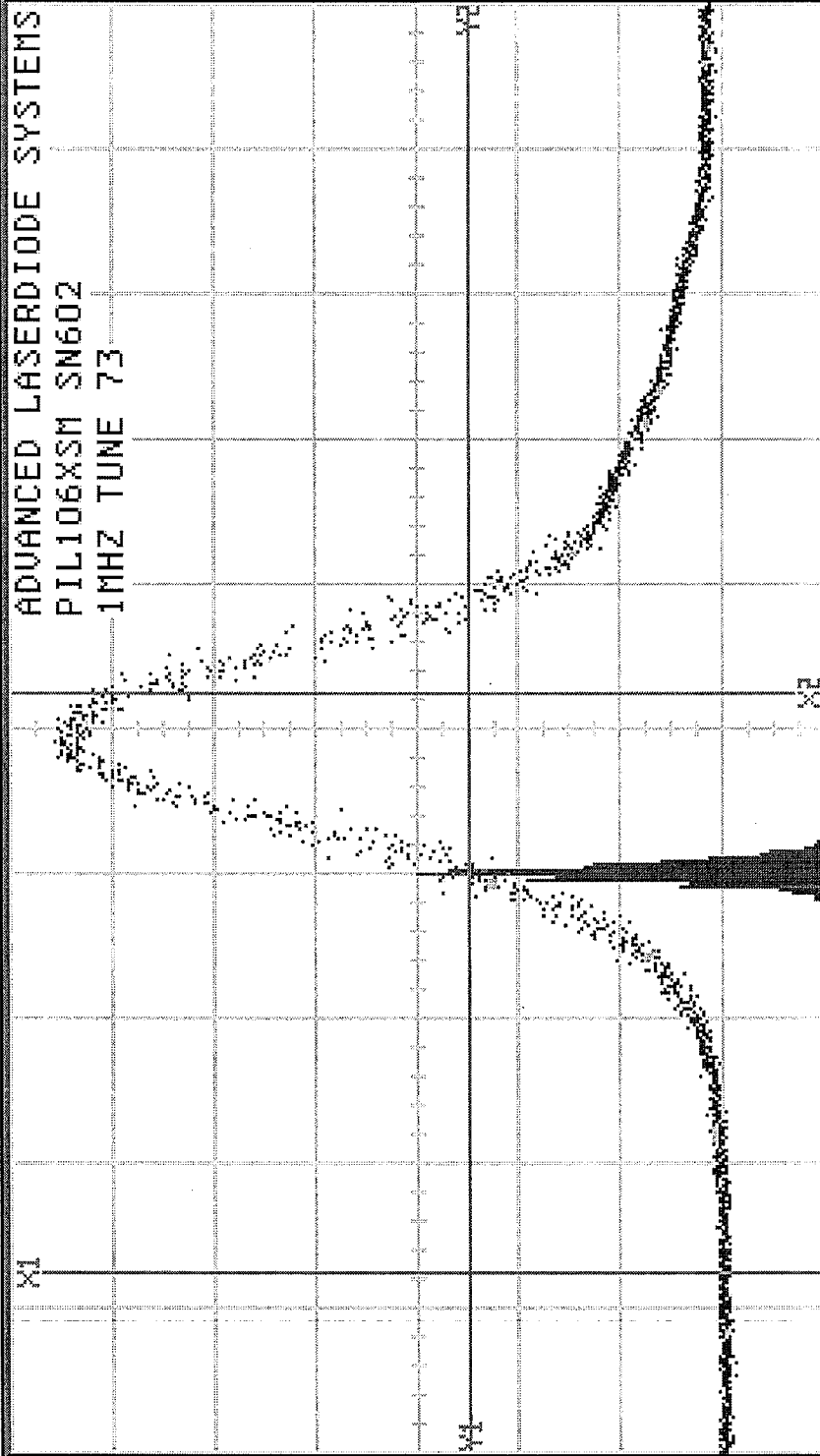
ADVANCED LASERDIODE SYSTEMS
PIL106XSM SN602
1MHZ TUNE 73



20.0 ps/div ↑ 37.2450 ns

	current	mean	std dev
Risetime(1)	21.54 ps	22.48 ps	860 fs
Falltime(1)	35.74 ps	37.56 ps	1.69 ps
+ width(1)	29.26 ps	31.02 ps	1.00 ps
V max(1)	131.158 mV	132.015 mV	1.108 mV

Histogram is enabled...



20.0 ps/div

37.2450 ns

histogram

scale	42 hits/div	offset	0 hits
mean	37.22536 ns	median	37.22511 ns
std dev	1.36102 ps	hits	1.087 khits
p-p	9.33 ps	peak	169 hits
		$\mu \pm 1\sigma$	74.2%
		$\mu \pm 2\sigma$	95.6%
		$\mu \pm 3\sigma$	99.6%

Hist window

Scale source

channel 1

X1 Position

37.17000 ns

Y1 Position

50.00 mV

X2 Position

37.25000 ns

Y2 Position

50.00 mV

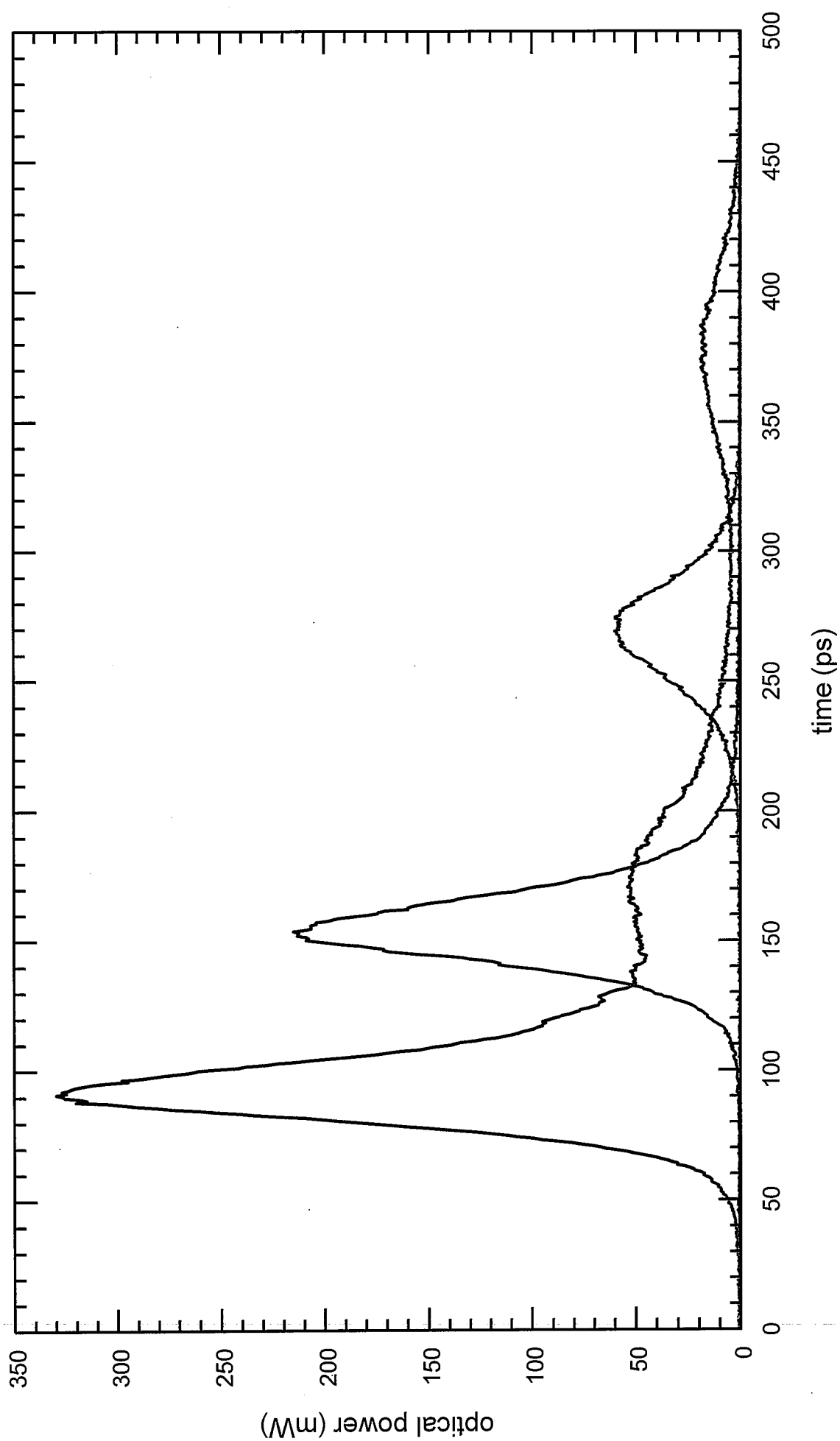
Default

window

Done

PiL106XSM, SN 602, streak camera scan at 100kHz after fiber

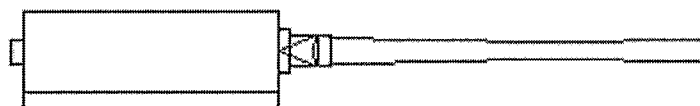
tune 82%: 43ps-60mW (blue), 73%: 30ps-215mW (nominal black) and 54%: 29ps-330mW (red)



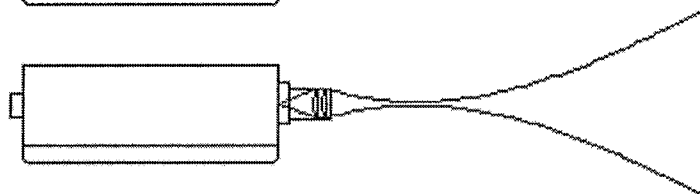
PiLas Optical Setup

The standard system consists of an optical head and additional optics. In dependence of the laser wavelength and power we will choose the most suitable optical arrangement for your application. There are mainly three versions available. In the following pictures the mechanic corresponds to black color, the optics to blue and the beam path to red.

1. Head for Collimation and Focussing of Free Space Laser Beams:

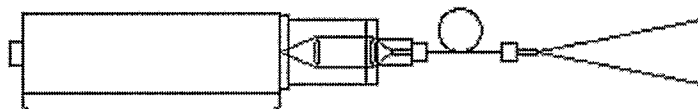


standard collimation

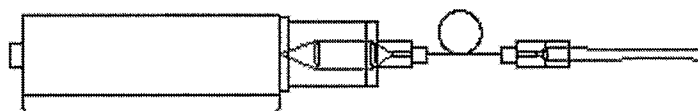


focussing with micro focus

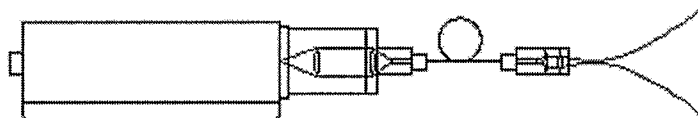
2. Head for Adjustable Fiber Coupling:



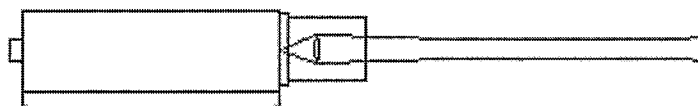
standard fiber coupling



fiber coupling with fiber collimator



fiber coupling with fiber collimator and micro focus



collimation with removed fiber coupling unit

M. CORNAT
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OFFRE DE PRIX N° OP0812053ALS

Date : Le 29 août 2012
Validité : 30 jours

M. CORNAT,
Suite à votre demande, nous vous prions de bien vouloir trouver ci-dessous nos meilleures conditions de prix et délais :

Poste 1 :

Réf: **EIG1000D**

External trigger (repetition rate: single shot to 1 MHz); Internal trigger (repetition rate: single shot, 10 Hz, ... 100kHz, 200 kHz, 500kHz, 1 MHz). Jitter between pre-trigger and optical output pulse is typ. < 3ps.

Prix unitaire HT :

3 802, - €

Poste 2 :

Réf: **PIL106**

PiLas optical head
Wavelength 1060nm±15nm, spectral width <7nm, pulse width (FWHM) typ. <40ps, peak-power through collimating optics typ. >300 collimated beam shape of max. ~3.2 mm by ~1.3mm.

Prix unitaire HT :

4 125, - €

Prix Total HT :

7 927, - €

Option :

Réf: **PIL106SM**

For coupling of single (or multi) mode fibres, FC/APC reception, single mode fiber coupling efficiency >40 % compared to free space, completely adjusted with single mode fibre with FC/APC – FC/PC connectors

Prix unitaire HT :

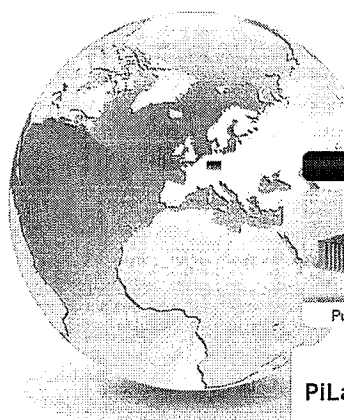
2 157, - €

T.V.A. 19,6% en sus

Prix ferme en euros

Prix franco de port et d'emballage

Délais : 6 à 8 semaines. Une date de livraison ferme sera établie une semaine après réception de la commande.



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Custom-Made

PiLas

Picosecond gain switched laser diode module for OEM and R&D applications

(Please contact us for other wavelengths, pulse widths, power)

PiL---X	wavelength (nm)	tolerance (nm)	spectral width (nm)	pulse width (ps)	peak power (mW)	avg. Power (mW) (1)
PiL037X	375	± 10	< 5	< 45	> 300	2
PiL040X	405	± 15	< 5	< 45	> 300	2
PiL044X	440	± 20	< 5	< 60	> 150	1.5
PiL047X	470	± 10	< 5	< 60	> 150	1.5
PiL048X	480	± 10	< 5	< 60	> 100	1
PiL051X	510	± 20	< 10	< 80	> 100	1
PiL063X	635	± 15	< 7	< 45	> 200	1.5
PiL067X	665	± 15	< 7	< 45	> 200	1.5
PiL069X	690	± 15	< 7	< 50	> 200	1.5
PiL077X	770	± 20	< 7	< 50	> 100	1
PiL083X	830	± 15	< 10	< 45	> 100	1
PiL085X	850	± 15	< 10	< 50	> 100	1

Data Sheets

PiLas (pdf, 319 KB)

Options (pdf, 168 KB)

Optical Setup (pdf, 221 KB)

Pictures



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