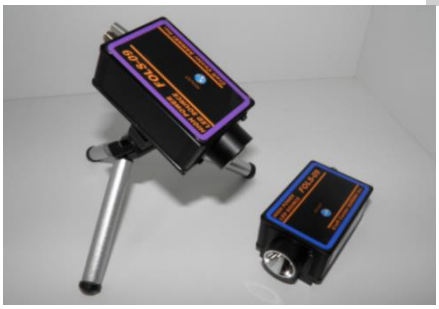
FIBER OUTPUT LIGHT SOURCE
for
ANALYSIS and EXPERIMENT

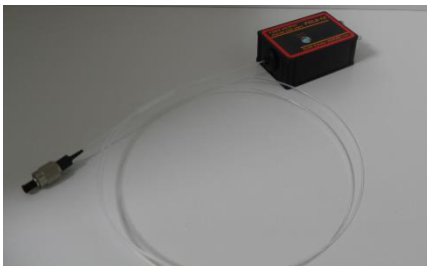













CRAFT CENTER SAWAKI Inc.

7708-35,Miyakoda-cho,Kita-ku,Hamamatsu-city,Shizuoka,431-2102,JAPAN
TEL:+81-53-482-8620 FAX:+81-53-482-8621
Emai:sales@ccsawaki.com URL: http://www.ccsawaki.com/

CONTENTS

We are developing optical component, light source and measuring instrument for the contribution on the progress in science and technology.
Following production line-ups are available.

PRODUCTION	OUTLINE
FOLS-01	MM fiber output LED source
FOLS-02	SM fiber output LD source
FOLS-03	MM fiber output high power LD source
FOLS-04	SM fiber output SLD source
FOLS-05	MM fiber output broad band LED source
FOLS-06	MM fiber output LED function generator
FOLS-07	TTL triggered fiber output pulsed LD source
FOLS-08	Fiber output optical pulse generator(LD,LED,SLD)
FOLS-10	MM fiber output nano-second pulsed LED unit
FOLS-11	Fiber output nano-second pulsed LD source
FOLS-12	Fiber output pico-second pulsed LD source
Accessories	Collimator lens, monitor photodiode, pulse generator

COMPANY INFORMATION

- Company name: CRAFT CENTER SAWAKI Inc.
- Location/Contact： 7708-35,Miyakoda-cho,Kita-ku,Hamamatsu-city,Shizuoka,431-2102,JAPAN
- TEL：+81-53-482-8620
- FAX：+81-53-482-8621
- Email：sales@ccsawaki.com
- URL： http://www.ccsawaki.com
- Establishment：January 2011
- Paid-in Capital：3,000,000 JPY
- Representative director/President：Akihiro Sawaki
- Business: Development and manufacturing of optical component, light source and optical instrument

MM fiber output LED source : FOLS-01

FOLS-01 is a small size LED source including output fiber, LED chip, driving circuit and power supply.

Fringe-free and speckle-free optical beam is generated. Any color of white, UV, RGB and IR is selectable.

Strobe emission mode is available with external TTL trigger. Output fiber of 600μm core or 200μm core is selectable.

FEATURE

- Easy handling with fiber output
- Small dimension of palm top size
- Color: white, UV, RGB and IR
- Fringe-free, speckle-free emission
- Excellent power stability
- Strobe emission mode with external TTL trigger

APPLICATIONS

- Exciting source for fluorescence experiment
- Fringe–free and speckle-free optical measurement
- Microscope illumination
- Spectral analysis
- Small area illumination
- Optical detector and component evaluation

SPECIFICATIONS

color	white	UV	violet	blue	green	yellow	amber	red	deep red	IR	IR
peak wavelength(nm)	---	365, 385	405	449, 465, 503	520	597	624	640, 660	760, 780, 810	860, 950	1300
spectral torelance(nm)	---	±20									
spectral width(nm)	---	10	20	25	33	18	18	18	25	30	70
max oputput power(600μm core)	25	25	25	25	10	6	20	25	5	15	0.5
max oputput power(200μm core)	2.5	2.5	2.5	2.5	1	0.6	2	2.5	0.5	1.5	0.05
fiber	quartz 600μm core or 200μm core NA0.48 length~1m FC connector output										
strobe mode operation	external TTL trigger input(active low) max rate ~1kHz										
power supply/dimension	AC100-240V 50/60Hz 0.2A 50(W)x40(H)x70(D)mm / 200g										

Temperature stabilized SM fiber output LD source : FOLS-02

FOLS-02 is a LD source with SM output fiber, LD chip, TEC, driving circuit and power supply.

375nm ~ 1620nm wavelength region can be selected for each application.

Output power is 1mW ~ 10mW CW.

Pulse emission mode is available with external TTL trigger.

LD module inside is temperature stabilized for stable power and wavelength emission.

FEATURE

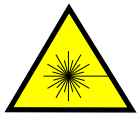
- Easy handling with fiber output
- Wavelength region : 375nm~1620nm
- 1mW-10mW output power
- Stable power and wavelength emission
- Pulse emission with external TTL trigger

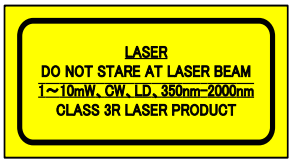
APPLICATIONS

- Exciting source for fluorescence experiment
- Evaluation of PD, PMT, fiber and optical components
- Spectral analysis
- Alignment of Optical system

SPECIFICATIONS

peak wavelength(nm)	375	405	450, 473, 488	520	640, 660	785	850	980	1064	1310, 1550	1620
spectral torelance(nm)	±10										
max output power(mW)	1	1	10	10	10	10	10	10	10	10	4
power stability(%)	±1										
fiber MFD(μm)	2.9	2.9	3.5	3.5	4	5.0	5.0	4.2	4.2	9	9.0
fiber NA	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.13	0.13
fiber length	~1m										
output optical connector	FC/PC										
operation control	ACC and TEC										
pulse emission mode	External TTL trigger input (active high) max rate > 1kHz										
power supply/dimension	AC100-240V 50/60Hz 0.3A 60(W)x50(H)x120(D)mm /400g										





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Temperature stabilized MM fiber output LD source : FOLS-03

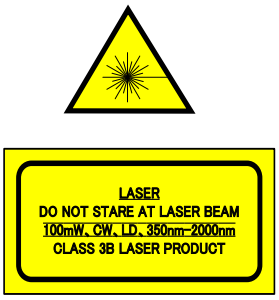
FOLS-03 is a LD source with MM output fiber, LD chip, TEC, driving circuit and power supply.
375nm ～ 1064nm wavelength region can be selected for each application.
Output power is 15mW ～ 100mW CW.
Pulse emission mode is available with external TTL trigger input.
LD module inside is temperature stabilized for stable power and wavelength emission.

FEATURE

- Easy handling with fiber output
- Wavelength region 375nm～1064nm
- 15mW-100mW high output power
- Stable power and wavelength emission
- Pulse emission with external TTL trigger

APPLICATIONS

- Exciting source for fluorescence experiment
- Evaluation of PD, PMT, fiber and optical components
- Spectral analysis
- Alignment of Optical system



SPECIFICATIONS

peak wavelength(nm)	375	405	450	473	488	520	640, 660	785	808	850	980	1064
spectral torelance(nm)	±10											
max output power(mW)	100	80	40	40	40	30	70	70	100	70	70	100
power stability(%)	±2											
fiber	SI105/125 NA0.22 length～1m FC connector output											
operation control	ACC and TEC											
pulse emission mode	Externl TTL trigger input(active high) max rate＞1kHz											
power supply / dimension	AC100-240V 50/60Hz 0.42A 70(W)x50(H)x100(D)mm /400g											

SM fiber output SLD source : FOLS-04

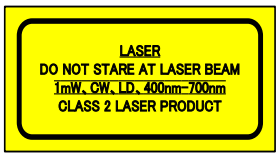
FOLS-04 is a SLD source with SM output fiber, SLD chip, TEC, driving circuit and power supply.
680nm ～ 1540nm wavelength region can be selected for each application.
Output power is ～ 1mW CW.
Pulse emission mode is available with external TTL trigger input.
SLD module inside is temperature stabilized for stable power and wavelength emission.

FEATURE

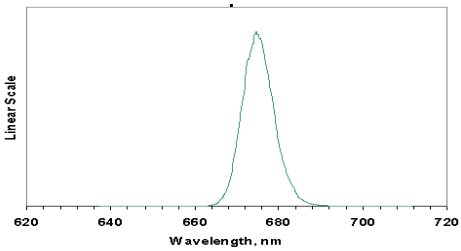
- Easy handling with fiber output
- Wavelength region 680nm～1540nm
- Wide band spectrum and low coherency
- Fringe-free, speckle-free emission
- Stable power and spectrum emission
- Pulse emission with external TTL trigger

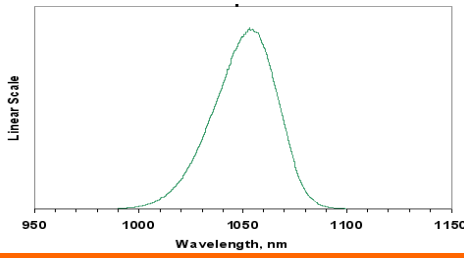
APPLICATIONS

- Fringe-free and speckle-free optical measurement
- Evaluation of PD, PMT, fiber and optical components
- Spectral analysis



SPECTRUM





SPECIFICATIONS

peak wavelength(nm)	680	785	830	1050	1310	1540
spectral torelance(nm)	±20					
spectral width(nm)	10	15	20	35	25	35
max output power(mW)	～1mW					
power stability(%)	＜±5%					
fiber MFD(μm)	5.9	5.6	5.6	5.9	9.0	9.0
fiber NA	0.14	0.14	0.14	0.14	0.13	0.13
fiber length	＞70cm					
output optical connector	FC/APC					
operation control	ACC and TEC					
pulse emission mode	External TTL trigger input (active high) max rate＞1kHz					
power supply / dimension	AC100-240V 50/60Hz 0.42A 60(W)x50(H)x120(D) mm/400g					

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MM fiber output broad band LED source : FOLS-05

FOLS-05 is a LED light source with MM output fiber, 3-LED chips, driving circuit and power supply.

UV ～ IR broad spectrum emission can be generated by selecting 3 wavelength LEDs.

Fringe-free and speckle-free emission is generated.

Output power is ～ 1mW CW each wavelength.

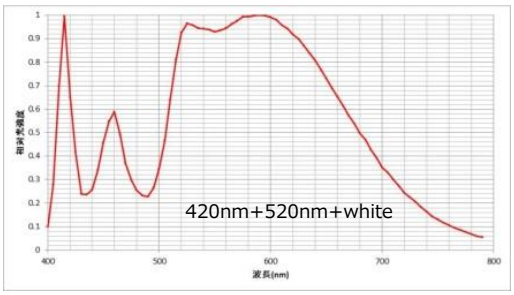
FEATURE

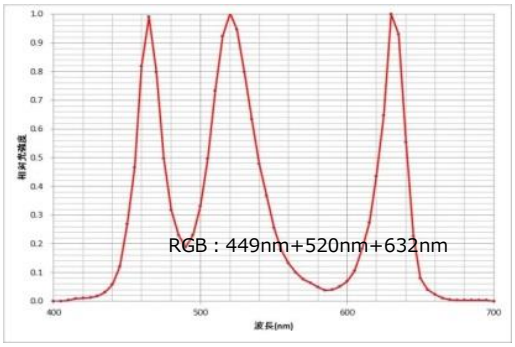
- Easy handling with fiber output
- Broad spectrum 365nm～940nm
- 3 LEDS are selectable
- Fringe-free and speckle-free emission
- Excellent power stability

APPLICATIONS

- Evaluation of optical components and detector
- Reflectance and transmittance measurement
- Fringe-free and speckle-free optical measurement
- Microscope illumination
- Spectral analysis

SPECTRUM EXAMPLE





SPECIFICATIONS

wavelength(nm)	white,365,385,405,420,449,465,520,597,624,640, 660,720,760,780,810,830,860,870,950
spectral width(nm)	10-30(depending each LED)
No. of LED	3pcs（any LED is avaiable in wavelength line up)
output fiber	SI600μmMM fiber、NA0.5、length～1m, FC connector output
operation control	ACC
Max output power	～1mW each (depending on LED)
power stability	～±1%
power supply / dimension	AC100-240V 50/60Hz 0.3A 60(W)x50(H)x120(D)mm /300g

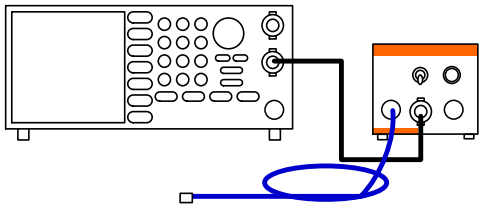
MM fiber output LED function generator FOLS-06

FOLS-06 is a MM fiber output LED source with operated external function generator.

Color of white, UV, RGB and IR can be selected for each application.

DC, square, triangle, sine, and digital pattern optical output is generated.

SYSTEM CONFIGURATION



FEATURE

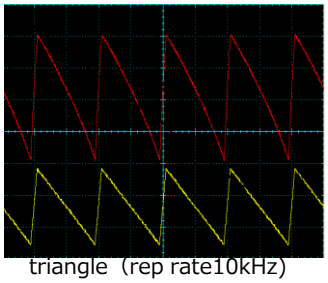
- Easy handling with fiber output
- DC, square, triangle, sine, digital pattern emission
- max repetition rate 1MHz
- External function generator operation
- Color: White, UV, RGB, IR
- Fringe-free and speckle-free

APPLICATIONS

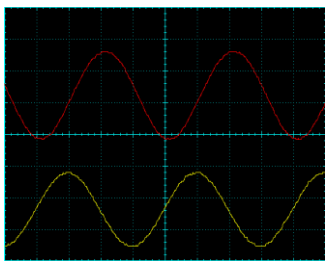
- Exciting source for fluorescence experiment
- Lock-in measurement
- Synchronized pulse illumination
- Microscope illumination
- Spectral analysis
- Fringe-free and speckle-free optical measurement

OUTPUT WAVEFORM

red : optical waveform
yellow : driving waveform)



triangle（rep rate10kHz)



sine（rep rate 1MHz)

SPECIFICATIONS

color	white	UV	blue	green	yelloe	red	deep red	IR
peak wavelength(nm)	---	365, 385	405,449, 465,503	520	597	624,640, 660	760,780	810,830, 860,950
spectral torelance(nm)	---	±20						
spectral width(nm)	---	9	25	33	25	18	25	30
max output power(mW)(600μmcore)	20			5	10		5	10
max output power(mW)(200μmcore)	2			0.5	1		0.5	1
output optical waveform	square、triangle、sine、pulse pattern, DC							
repetitiom	0.1Hz～1MHz							
rise time	～500ns							
fiber	600μm core or 200μm core NA0.48, length～1m, FC connector output							
power suppply / dimension	optical unit : AC100-240V 50/60Hz 0.3A 60(W)x50(H)x120(D) mm/300g							

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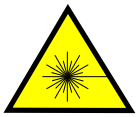
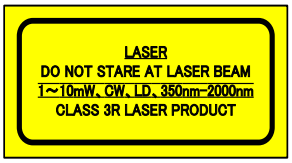
TTL triggered fiber output pulsed LD source : FOLS-07

FOLS-7 is a fiber output pulsed LD source controlled with external TTL.
375nm ～ 1620nm wavelength region can be selected for each application.
Output peak power is 1mW ～ 100mW(depending on LD and fiber).
LD module inside is temperature stabilized for stable power and wavelength emission.





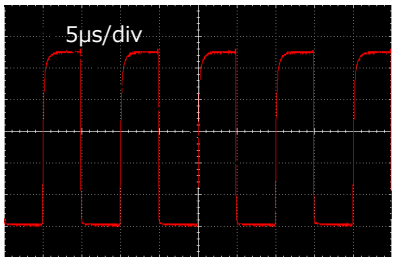
FEATURE

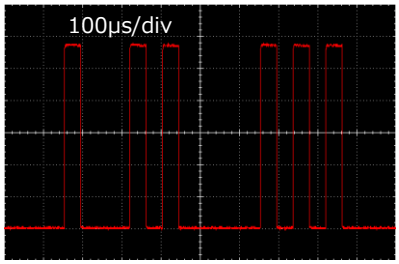
- Easy handling with fiber output
- Pulse emission with externa TTL trigger
- Max repitition rate 1MHz
- Wavelength region 375nm～1620nm
- Stable power and wavelength emission

APPLICATIONS

- Exciting source for fluorescence experiment
- Lock-in measurement
- Digital pattern emission
- Spectral analysis
- Evaluation of photo-detector

OUTPUT OPTICAL PULSE





SPECIFICATIONS

color	UV	blue	green	red	NIR	IR
peak wavelength(nm)	375	405,450, 473,488	520	640,660	785,808, 850,980, 1064	1310,1550, 1620
spectral torelance(nm)	±10					
max output power	1mW～100mW (depending on LD and fiber)					
fiber	SM fiber or SI100MM fiber、length～1m、 FC connector output					
repetition	max 1MHz and DC					
rise time	～500ns					
Trigger	External TTL Trigger input (active high) max 1MHz min pulse width～500ns					
power supply / dimension	AC100-240V 50/60Hz 0.3A 100(W)x50(H)x125(D)mm/450g					

Fiber output optical pulse generator : FOLS-08

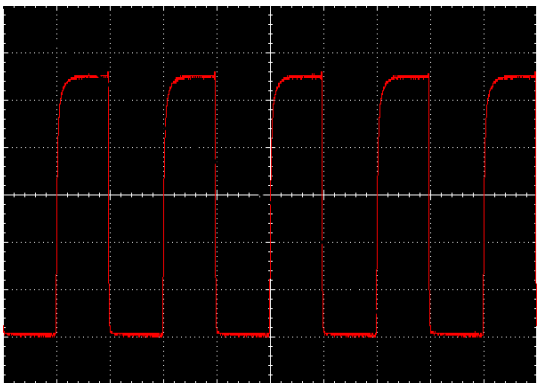
FOLS-08 is a fiber output pulsed optical generator controlled with internal pulse driver.

Any pulse width and repetition can be set with front panel operation.

LED , LD and SLD of 375nm ～ 1770nm wavelength is selectable for each application.

LD and SLD module inside are temperature stabilized for stable power and wavelength emission.

PULSE EMISSION



Pulse width 5μs, repetition 100kHz

FEATURE

- Easy handling with fiber output
- Pulse operation with internal pulse driver
- Min cycle 1μs
- Min pulse width 500ns
- LED, LD and SLD is selectable
- UV, VIS, IR

APPLICATIONS

- Exciting source for fluorescence experiment
- Lock-in measurement
- Spectral analysis
- Evaluation of photo-detector

SPECIFICATIONS

device	LED	LD	SLD
peak wavelength(nm)	365,385,405,449,465,503,520,597,624,640,660, 675,760,780,810,860,950,white	375,405,445,473,488,520,640,660,785,808,8 50,980,1064,1310,1550,1620	680,785,830,1050,1310,1540
spectral torelance(nm)	±20	±5～±20	±20
max peak power(mW)	1～30	1～100	1
fiber	MM fiber 600μm core or 200μm core, NA=0.48, length～1m, FC connector output	SM fiber or SI100/125MM fiber, length～1m, FC/PC connector output	SM fiber , length～1m, FC/APC connector output
repetition	1μs～1s and DC		
puse width	min 500ns		
external trigger mode	TTL trigger input(active high), max rep rate 1MHz		
power supply / dimension	AC100-240V 50/60Hz 0.3A 2008W)x50(H)x125(D)mm/700g		

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MM fiber output nano-second pulsed LED unit : FOLS-10

FOLS-10 is a palm top size pulsed LED unit including MM output fiber, LED chip, driving circuit and power supply.

FOLS-10 generates high speed optical pulse(Tr=25ns) with external TTL trigger. Pulse width depends on trigger pulse width.

Any color of white, UV, RGB and IR is selectable with fringe-free and speckle-free emission.

Output fiber of 600μm core or 200μm core is selectable.

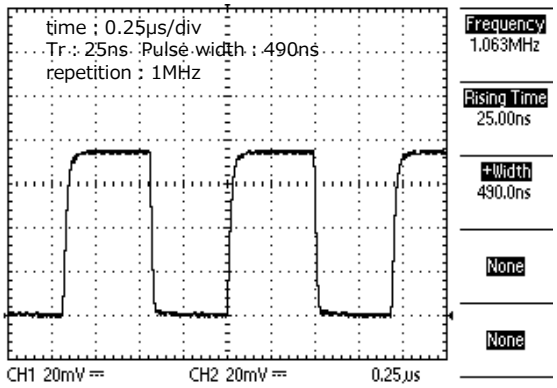
FEATURE

- Easy handling with fiber output
- High speed pulse emission with Tr=25ns
- Palm top size
- Color:UV, RGB, IR
- Fringe-free and speckle-free emission
- Excellent power stability

APPLICATIONS

- Exciting source for fluorescence experiment
- Fringe-free and speckle-free optical measurement
- Lock-in measurement
- Pulse response measurement of photo-detector

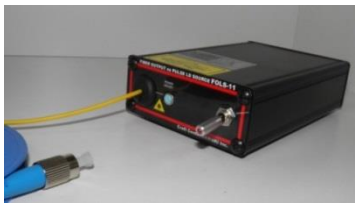
PULSE EMISSION



SPECIFICATIONS

color	white	UV	violet	blue	green	yellow	amber	red	deep-red	IR
peak wavelength(nm)	---	365,385	405	449,465,503	520	597	624	640,660	760,780,810	860,950
spectral torelance(nm)	---	±20								
spectral width(nm)	---	10	20	25	33	18	18	18	25	30
rise time/pulse width	rise time : 25ns、pulse width : min 50ns									
peak power(mW)(600μmcore)	5	5	5	5	3	3	5	5	2	5
peak power(mW)(200μmcore)	0.5	0.5	0.5	0.5	0.3	0.3	0.5	0.5	0.2	0.5
fiber	quartz 600μm core or 200μm core NA0.48 length~1m FC connector output									
trigger input	TTL input(active high) max rate~10MHz									
power supply / dimension	AC100-240V 50/60Hz 0.2A 40(W)x24(H)x60(D)mm/ 70g									

Fiber output nano-second pulsed LD source : FOLS-11



FOLS-11 is a fiber output pulsed LD source including output fiber, LD chip, driving circuit and power supply.

FOLS-11 generates high speed optical pulse (Tr~5ns and max > 30MHz repetition) with external TTL trigger. Pulse width depends on trigger pulse width.

375nm ~ 1620nm wavelength region can be selected for each application.

LD module inside is temperature stabilized for stable power and wavelength emission.

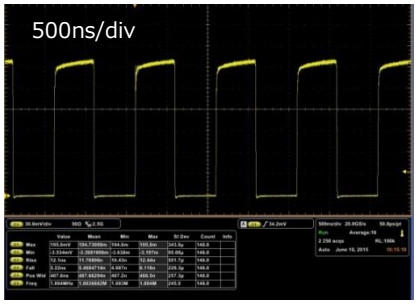
FEATURE

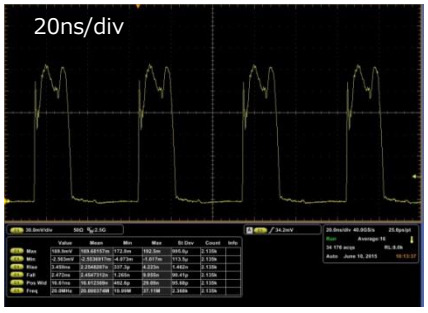
- Easy handling with fiber output
- Pulse emission with external TTL trigger
- High speed Tr=5ns, > 30MHz repetition
- Wavelength region 375nm~1620nm
- Excellent power and wavelength stability

APPLICATIONS

- Exciting source for fluorescence experiment
- Lock-in measurement
- Digital pattern emission
- Spectral analysis
- Pulse response evaluation of photo-detector

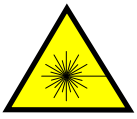
PULSE EMISSION





SPECIFICATIONS

wavelength region	UV	blue	green	red	NIR	IR
peak wavelength(nm)	375	405,450, 473,488	520	640,660	785,808, 850,980, 1060	1310,1550, 1620
wavelength torelance(nm)	±10					
max peak power	> 1mW (depending on LD and fiber)					
fiber	SM fiber or SI100 MM fiber, length~1m、 FC connector output					
Tr	~5ns					
trigger input	TTL (active high), max rate 30MHz					
power supply / dimension	AC100-240V 50/60Hz 0.3A / 75(W)x30(H)x105(D) mm/250g					



LASER
DO NOT STARE AT LASER BEAM
1~10mW, CW, LD, 350nm-2000nm
CLASS 3R LASER PRODUCT

CRAFT CENTER SAWAKI Inc.

7708-35,Miyakoda-cho,Kita-ku,Hamamatsu-city,Shizuoka,431-2102,JAPAN
TEL:+81-53-482-8620 FAX:+81-53-482-8621
Email:sales@ccsawaki.com URL: http://www.ccsawaki.com/

Fiber output pico-second pulsed LD source : FOLS-12

FOLS-12 is a fiber output pulsed LD source including output fiber, LD chip, driving circuit and power supply.

FOLS-12 generates high speed optical pulse (pulse width 500ps fixed and max ＞50MHz repetition) with external TTL trigger.

375nm ～ 620nm wavelength region can be selected for each application.

LD module inside is temperature stabilized for stable power and wavelength emission.

FEATURE

- Easy handling with fiber output
- Pulse emission with external TTL trigger
- Optical pulse width～500ps fixed, 50MHz repetition
- Wavelength region 375nm～1620nm
- Excellent power and wavelength stability

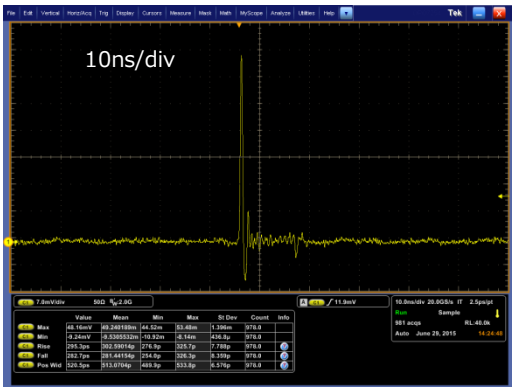
APPLICATIONS

- Exciting source for fluorescence experiment
- Lock-in measurement
- Impulse response measurement of PMT and PD

SPECIFICATIONS

wavelength region	UV	blue	green	red	NIR	IR
peak wavelength(nm)	375	405,450, 473,488	520	640,660	785,808, 850,980, 1060	1310,1550, 1620,1770
wavelength torelance(nm)	±10					
max peak power	＞1mW (depending on LD and fiber)					
fiber	SM fiber or SI100 MM fiber, length～1m、 FC connector output					
pulse width	～500ps fixed					
Trigger input	TTL (active high), max 50MHz　min pulse width＞10ns					
power supply / dimension	AC100-240V 50/60Hz 0.3A / 75(W)x30(H)x105(D)mm /250g					

PULSE WAVEFORM



ACCESSORIES

FC connector coupled collimator lens

- Wavelength : 350～700nm, 650～1050nm、1050～1620nm
- Beam waist diameter : ～1mm (SM fiber coupled)
- Beam divergence : 0.04°～0.13° (SM fiber coupled)
- focusing dial included

Monitor photodiode

- Input : FC connector
- Output : 50Ω BNC connector
- Sensitive wavelength : 320nm～1100nm(Si), 900nm～1700nm(InGaAs)
- Tr : ＜2ns
- Power supply : 9V battery included

10MHz pulse generator unit : PGU-10M

- Repetition rate : 3 range (10kHz～100kHz,100kHz～1MHz,1MHz～10MHz)
- Output : 5V square, Duty 50%(fixed)
- Power supply : +6V AC adopter included

50MHz pulse generator unit : PGU-50M

- Repetition rate :
  - continuous : 1kHz～10kHz, 10kHz～100kHz,100kHz～1MHz
  - fixed : 2MHz,5MHz,10MHz,20MHz,50MHz
- Output : 5V square, Duty 50%(fixed)
- Power supply : +6V AC adopter included

100kHz pulse generator unit : PGU-100k

- Repetition rate : 1Hz,10Hz,100Hz,1kHz,10kHz,100kHz
- Output : 5V square, Duty50% fixed
- Power supply : +6V AC adopter included

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