



## **LD & LED MODULES FOR TEST EQUIPMENT**

**Fiber Optic Devices Ltd. produces a  
complete line of fiber optic test  
equipment for all applications**

***EUROPE:***

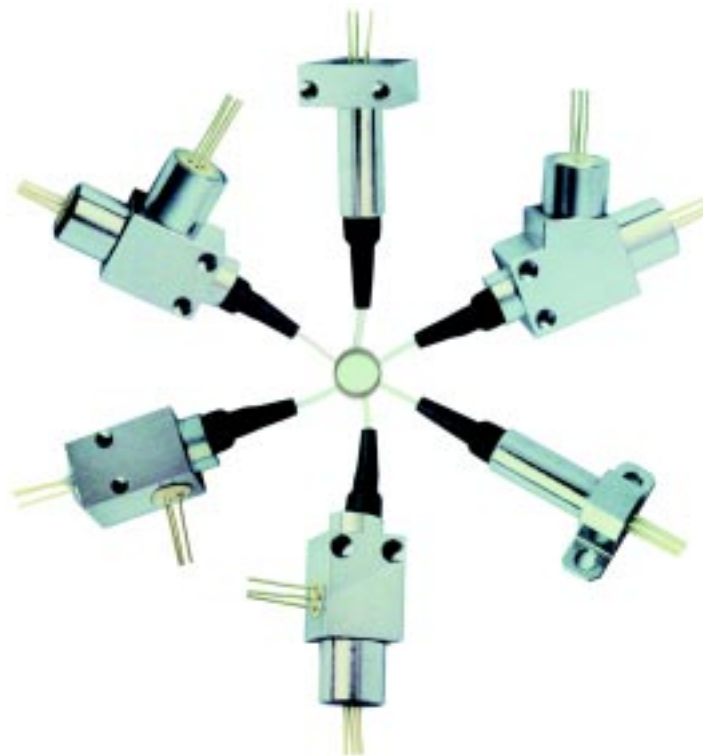
*LIFODAS, UAB*  
PO box 2693, 2009 Vilnius, Lithuania  
phone (370 2) 33 35 68  
fax (370 2) 26 35 28  
e-mail:sales@fods.com  
www.fods.com

***RUSSIA & CIS:***

*Fiber Optic Devices Ltd.*  
PO Box 48, 129010  
Moscow, Russia  
phone (7 095) 105 34 64  
fax (7 095) 105 34 68  
e-mail:fod@glasnet.ru

***USA:***

*Fiber Optic Devices*  
1204 Main Street, Suite 220  
Branford, CT 06405  
phone (1 203) 483 89 61  
fax (1 203) 481 85 16  
e-mail:leon.a@fods.com



*Some people are thinking about test instruments...*

How to make these instruments to be accurate, compact,  
and user friendly.  
But they use standard components designed for stationary  
transmission equipment -

**WE DON'T.**

**WE DESIGN COMPONENTS  
FOR  
COMPACT SMART INSTRUMENTATION.**

A. Modules with pigtails

- ◆ LED Modules
- ◆ LD Modules
- ◆ Dual LED Modules
- ◆ Dual LD Modules
- ◆ Duplex LD&PD Modules
- ◆ Pulsed LD Modules

B. Modules with adapters

- ◆ LED Modules with changeable adapters
- ◆ LD Modules with changeable adapters
- ◆ LED Modules receptacle

## A. MODULES WITH PIGTAILS

### LED MODULES

- ◆ Low cost
- ◆ High output power in 62.5/125 fiber
- ◆ High coupling ratio according TIA/EIA-526-14A



Type	Package	Wavelength, nm	Chip Type	Output Power, dBm	Operating Temp.	Application
3102A	K	850±20	LED	-15 @ 62.5/125	-20 to 60°C	LAN Tester
3104A	L	850±20	LED	-15 @ 62.5/125	-20 to 60°C	LAN Tester
3102B	K	1320±20	LED	-15 @ 62.5/125	-20 to 60°C	LAN Tester
3104B	L	1320±20	LED	-15 @ 62.5/125	-20 to 60°C	LAN Tester

### LASER MODULES

- ◆ Low threshold current
- ◆ High output power in SM fiber
- ◆ Wide selection of wavelengths and packages

Type	Package	Wavelength, nm	Chip Type	Output Power, mW	Operating Temp.	Application
3208A	K	635	FP	1 @ 9/125	-20 to 60°C	Fault Locator
3213A	L	635	FP	1 @ 9/125	-20 to 60°C	Fault Locator
3208B	K	650	FP	1 @ 9/125	-20 to 60°C	Fault Locator
3213B	L	650	FP	1 @ 9/125	-20 to 60°C	Fault Locator
3214	K	850	FP	1 @ 50/125	-20 to 60°C	LAN
3209	L	850	FP	1 @ 50/125	-20 to 60°C	LAN
3214H	K	850	FP	10 @ 50/125	-20 to 60°C	LAN
3209H	L	850	FP	10 @ 50/125	-20 to 60°C	LAN
3215	K	980	FP	40 @ 9/125	-20 to 60°C	EDFA
3216	L	980	FP	1 @ 9/125	-20 to 60°C	EDFA
3202A	K	1310	FP	1 @ 9/125	-20 to 60°C	LAN, STM
3201A	L	1310	FP	1 @ 9/125	-20 to 60°C	LAN, STM
3202AH	K	1310	FP	3 @ 9/125	-20 to 60°C	LAN, STM
3201AH	L	1310	FP	3 @ 9/125	-20 to 60°C	LAN, STM
3217A	K	1310	DFB	1 @ 9/125	-20 to 60°C	STM, SDH
3218A	L	1310	DFB	1 @ 9/125	-20 to 60°C	STM, SDH
3202B	K	1550	FP	1 @ 9/125	-20 to 60°C	STM
3201B	L	1550	FP	1 @ 9/125	-20 to 60°C	STM
3202BH	K	1550	FP	2 @ 9/125	-20 to 60°C	STM
3201BH	L	1550	FP	2 @ 9/125	-20 to 60°C	STM
3217B	K	1550	DFB	1 @ 9/125	-20 to 60°C	STM, SDH
3218B	L	1550	DFB	1 @ 9/125	-20 to 60°C	STM, SDH
3217IB	Kw/isolator	1550	DFB	1 @ 9/125	-20 to 60°C	STM, SDH
3218IB	Lw/isolator	1550	DFB	1 @ 9/125	-20 to 60°C	STM, SDH
3202C	K	1625	FP	1 @ 9/125	-20 to 60°C	Supervision channel
3201C	L	1625	FP	1 @ 9/125	-20 to 60°C	Supervision channel

PM fiber pigtails available at special request

### DUAL LED MODULES

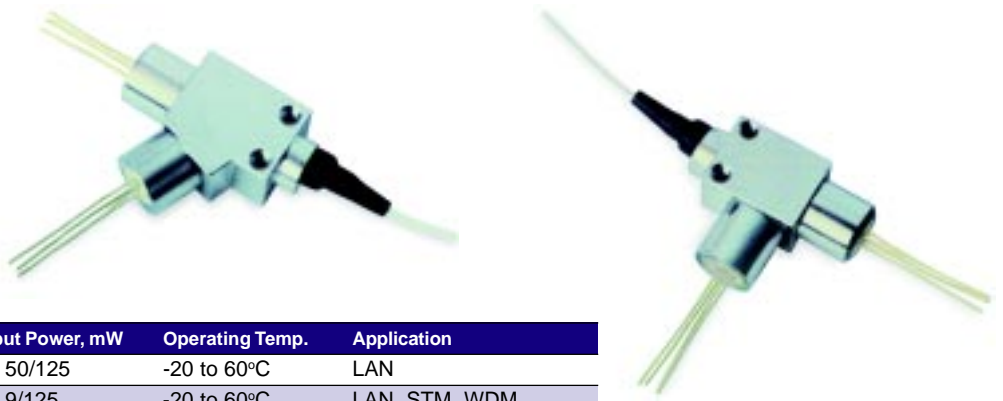
- ◆ Wavelength division multiplexing
- ◆ One package for two wavelengths
- ◆ High stability of output power

Type	Wavelength, nm	Chip Type	Output Power, dBm	Operating Temp.	Application
3106	850&1320	LED	-15 @ 62.5/125	-20 to 60°C	LAN



## DUAL LASER MODULES

- ◆ Two wavelengths at one output
- ◆ Low threshold current, low operating current
- ◆ High output power in SM fiber



Type	Wavelength, nm	Chip Type	Output Power, mW	Operating Temp.	Application
3219	850&1310	FP	1 @ 50/125	-20 to 60°C	LAN
3203	1310&1550	FP	1 @ 9/125	-20 to 60°C	LAN, STM, WDM
3211	1550&1625	FP	1 @ 9/125	-20 to 60°C	STM, WDM, supervision

## DUPLEX LD&PD MODULES

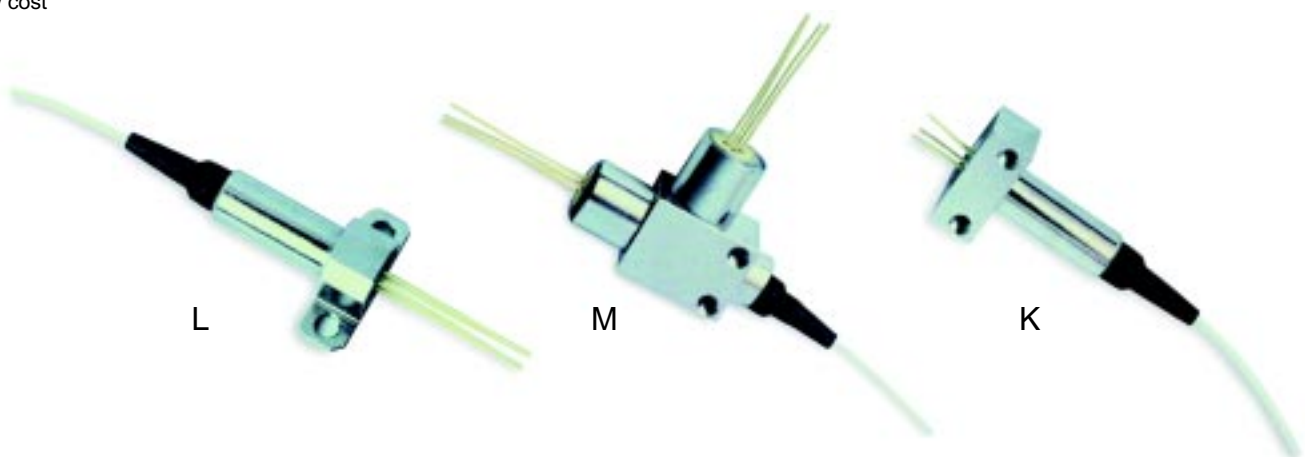
- ◆ High sensitivity
- ◆ Low cost
- ◆ Low polarization dependence



Type	Wavelength, nm	Chip Type	Output Power, mW	Sensitivity, A/W	Application
3302A	1310	FP	1 @ 9/125	>0.4	Optical Talk Set
3302B	1550	FP	1 @ 9/125	>0.4	Optical Talk Set

## PULSED LASER MODULES

- ◆ High pulse output
- ◆ Two wavelengths in one small package
- ◆ Low cost



Type	Package	Wavelength, nm	Chip Type	Output Power, mW	Operating Temp.	Application
3220	K	850	FP	80 @ 50/125	-20 to 60°C	OTDR
3221A	L	850	FP	80 @ 50/125	-20 to 60°C	OTDR
3210A	K	1310	FP	80 @ 9/125	-20 to 60°C	OTDR
3221B	L	1310	FP	80 @ 9/125	-20 to 60°C	OTDR
3210B	K	1550	FP	60 @ 9/125	-20 to 60°C	OTDR
3221C	L	1550	FP	60 @ 9/125	-20 to 60°C	OTDR
3212B	M	850&1310	FP	70/70 @ 50/125	-20 to 60°C	OTDR
3212A	M	1310&1550	FP	70/50 @ 9/125	-20 to 60°C	OTDR

## B. MODULES WITH ADAPTERS

### LED MODULES WITH CHANGEABLE ADAPTERS



- ◆ High coupling ratio according TIA/EIA-526-14A
- ◆ Easy to change adapters FC, ST, SC, Universal
- ◆ Easy to clean or repolish ferrule face

Type	Package	Wavelength, nm	Chip Type	Output Power, dBm	Operating Temp.	Application
3103A	N	850	FP	-15 @ 62.5/125	-20 to 60°C	LAN Tester
3103B	N	1320	FP	-15 @ 62.5/125	-20 to 60°C	LAN Tester
3105	O	850&1320	FP	-15 @ 62.5/125	-20 to 60°C	LAN Tester

### LASER MODULES WITH CHANGEABLE ADAPTERS

- ◆ Front panel mounting to save case space
- ◆ Easy to change adapter
- ◆ Easy to clean or repolish ferrule face



Type	Wavelength, nm	Chip Type	Output Power, mW	Operating Temp.	Application
3206DI	635	FP	1	-20 to 60°C	Fault Locator
3206CI	650	FP	1	-20 to 60°C	Fault Locator
3206AI	1310	FP	1	-20 to 60°C	Light Source
3206BI	1550	FP	1	-20 to 60°C	Light Source
3206EI	1625	FP	1	-20 to 60°C	Supervision Light Source

### LED MODULES RECEPTACLE

- ◆ All kind of packages\*
- ◆ Low cost
- ◆ High output power in 62.5/125 fiber

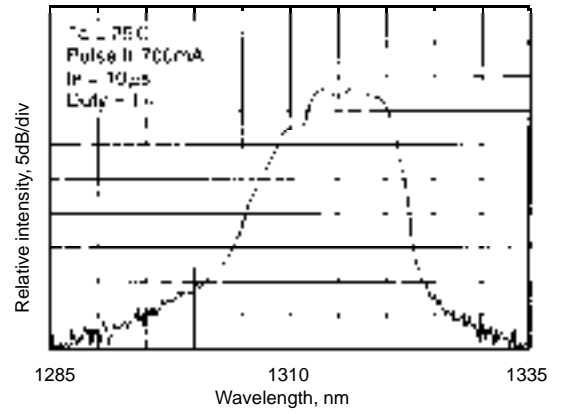


Type	Package	Wavelength, nm	Chip Type	Output Power, dBm	Operating Temp.	Application
3107A	S	850	LED	-15 @ 62.5/125	-20 to 60°C	LAN Transceiver
3108A	F	850	LED	-15 @ 62.5/125	-20 to 60°C	LAN Transceiver
3109A	T	850	LED	-15 @ 62.5/125	-20 to 60°C	LAN Transceiver
3107B	S	1320	LED	-15 @ 62.5/125	-20 to 60°C	LAN Transceiver
3108B	F	1320	LED	-15 @ 62.5/125	-20 to 60°C	LAN Transceiver
3109B	T	1320	LED	-15 @ 62.5/125	-20 to 60°C	LAN Transceiver

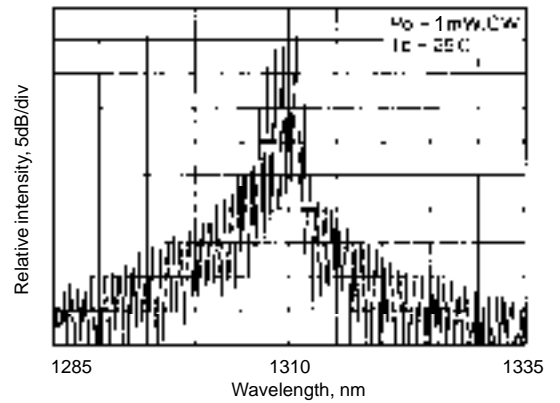
\* LC & MU receptacles available

SPECIFICATIONS	Conditions	ML776H10-01 (1310nm pulse LD)
Threshold current, mA	CW	20
Operating current, mA	CW, Po=2mW	30
Operating voltage, V	Pulse, I <sub>F</sub> =700mA*	3
Pulse light output, mW	Pulse, I <sub>F</sub> =700mA*	300
Centre wavelength, nm	Pulse, I <sub>F</sub> =700mA*	1310
Spectral width (RMS), nm	Pulse, I <sub>F</sub> =700mA*	7

\* Duty cycle = 1%, pulse width less than 10μs

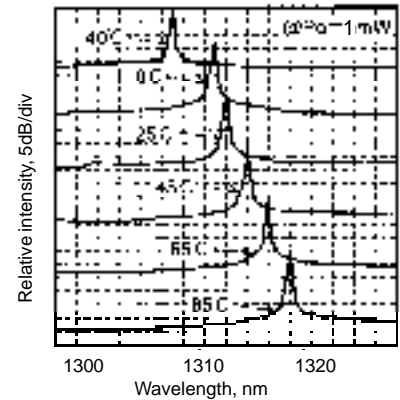


SPECIFICATIONS	Conditions	ML725B8F (1310nm FP LD)
Light output power, mW	-	2
Threshold current, mA	CW	5
Operating current, mA	CW, Po=1mW	20
Operating voltage, V	CW, Po=1mW	1.1
Slope efficiency, mW/mA	CW, Po=1mW	0.5
Center wavelength, nm	CW, Po=1mW	1310
Spectral width (RMS), nm	CW, Po=1mW	1
Monitoring output current (Photodiode), mA	CW, Po=1mW, V <sub>RD</sub> =1V	0.5
Rise and Fall times, ns	I <sub>F</sub> =I <sub>th</sub> , Po=1mW, 10~90%	0.3
Dark current (Photodiode), μA	V <sub>RD</sub> =10V	0.01
Capacitance (Photodiode), pF	V <sub>RD</sub> =10V, f=1MHz	10

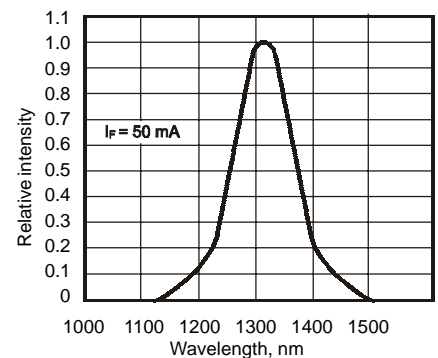


SPECIFICATIONS	Conditions	ML776H11F (1310nm DFB LD)
Light output power, mW	CW	1
Threshold current, mA	CW	6
Operating current, mA	CW, Po=1mW	18
Operating voltage, V	CW, Po=1mW	1.1
Slope efficiency, mW/mA	CW, Po=1mW	0.4
Peak wavelength, nm	CW, Po=1mW	1310
Monitoring output current (Photodiode), mA	CW, Po=1mW, V <sub>RD</sub> =1V, R <sub>L</sub> =10Ω*	0.2
Rise and Fall times, ns	I <sub>F</sub> =I <sub>th</sub> , Po=1mW, 10~90%	0.2
Side mode suppression ratio, dB	CW, Po=1mW, -40~+85°C	40

\* R<sub>L</sub> - Load resistance of photodiode

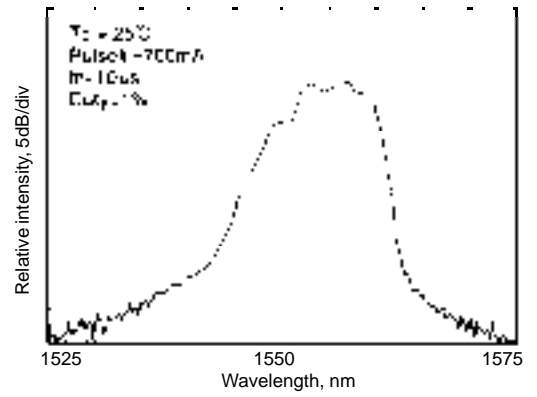


SPECIFICATIONS	Conditions	259006-1 (1300nm LED)
Optical Power in 62.5/125 fiber, dBm	-	-13 @ I <sub>op</sub> =20 mA
Forward voltage, V	-	1.4
Peak output wavelength, nm	-	1320
Spectral bandwidth between half power points, nm	-	135
Output rise/fall time, ns	100mA 50% duty cycle	2.5

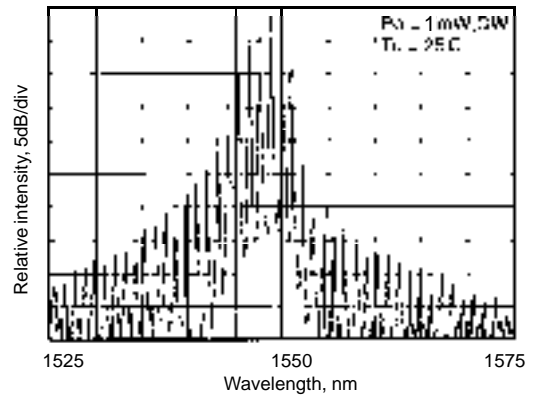


SPECIFICATIONS	Conditions	ML976H10-01 (1550nm pulse LD)
Threshold current, typ., mA	CW	30
Operating current, typ., mA	CW, Po=2mW	50
Operating voltage, V	Pulse, I <sub>F</sub> =700mA*	3
Pulse light output, mW	Pulse, I <sub>F</sub> =700mA*	60
Centre wavelength, nm	Pulse, I <sub>F</sub> =700mA*	1550
Spectral width (RMS), nm	Pulse, I <sub>F</sub> =700mA*	7

\* Duty cycle = 1%, pulse width 10μs

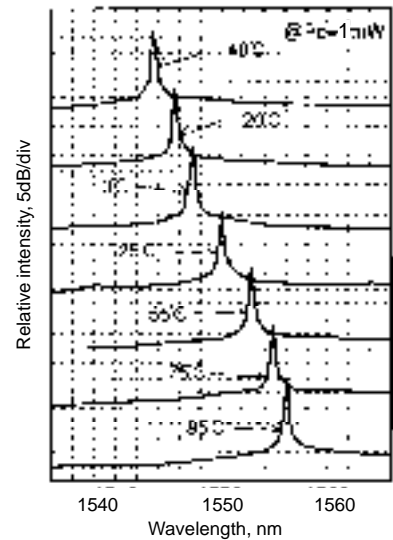


SPECIFICATIONS	Conditions	ML976H6F (1550nm FP LD)
Light output power, mW	CW	1
Threshold current, mA	CW	10
Operating current, mA	CW, Po=1mW	30
Operating voltage, V	CW, Po=1mW	1.1
Slope efficiency, mW/mA	CW, Po=1mW	0.25
Peak wavelength, nm	CW, Po=1mW	1550
Spectral width (RMS), nm	CW, Po=1mW	1.5
Monitoring output current (Photodiode), mA	CW, Po=1mW, V <sub>RD</sub> =1V	0.5
Rise and Fall times, ns	I <sub>F</sub> =I <sub>th</sub> , Po=1mW, 10~90%	0.2
Dark current (Photodiode), μA	V <sub>RD</sub> =10V	0.01
Capacitance (Photodiode), pF	V <sub>RD</sub> =10V, f=1MHz	10



SPECIFICATIONS	Conditions	ML976H11F (1550nm DFB LD)
Light output power, mW	CW	6
Threshold current, mA	CW	10
Operating current, mA	CW, Po=1mW	30
Operating voltage, V	CW, Po=1mW	1.2
Slope efficiency, mW/mA	CW, Po=1mW	0.25
Peak wavelength, nm	CW, Po=1mW	1550
Monitoring output current (Photodiode), mA	CW, Po=1mW, V <sub>HD</sub> =1V, R <sub>L</sub> =10Ω*	0.2
Rise and Fall times, ns	I <sub>F</sub> =I <sub>th</sub> , Po=1mW, 10~90%	0.2
Side mode suppression ratio, dB	CW, Po=1mW, -40~+85°C	40

\* R<sub>L</sub> - Load resistance of photodiode



SPECIFICATIONS	Conditions	OPF370A (850nm LED)
Optical Power in 62.5/125 fiber, dBm	I <sub>F</sub> =100mA*	-20 @ l <sub>op</sub> =20 mA
Forward voltage, V	I <sub>F</sub> =100mA	1.7
Peak output wavelength, nm	I <sub>F</sub> =50mA	850
Spectral bandwidth between half power points, nm	I <sub>F</sub> =50mA	35
Output rise time, ns	I <sub>F</sub> =100mA, 10-90%**	6
Output fall time, ns	I <sub>F</sub> =100mA, 10-90%**	6

\* Graded index fiber, 50μm core, N.A.=0.20, maximum value

\*\* Prebias @ 5mA current

