

RLM Series

1 to 10W Raman Fiber Lasers Modules

The RLM Series Raman Fiber Lasers were developed specifically to meet the rapidly growing demand in universal sources that could provide any wavelength in 1200 to 1700 range with output power up to 30W CW. These new pumps are ideal in different applications, where a compact high power single mode source required, varying from telecom, medical and industrial to a variety of laboratory test and measurement and scientific applications. These lasers, as no one solid-state laser, give you a total flexibility over wavelength choice in 1100 to 1700nm window. Linear polarized output option make these lasers even more attractive for scientific and R&D use.

Raman Fiber Lasers offer a superior pump source over other techniques such as frequency multiplexed single mode laser diode combiners by virtue of their cost, efficiency and ease of achieving high power. Emission wavelengths can be selected anywhere in the range from 1100nm to 1700nm. Linear polarization and higher power output, up to 30 watts, are available on request.

Main Features:

- ✓ **1100 to 1700nm wavelength choice**
- ✓ **Up to 30 Watts output optical power**
- ✓ **Telecom grade reliability**
- ✓ **Compact rugged package**
- ✓ **Very cost effective solutions**
- ✓ **Single mode fiber output**



Applications:

- ✓ **Remote Amplifier Pumping**
- ✓ **Distributed DWDM Raman Amplification**
- ✓ **Repeaterless Submarine Systems**
- ✓ **EDFA pumping**
- ✓ **Ultra-broadband Amplifiers**
- ✓ **Research & Development**

Common Parameters

RLM Series Raman Lasers consist of two components – an Ytterbium Fiber Laser and a Raman wavelength shifter. The Ytterbium Laser is a telecom-grade version of the IPG YLM Series Single Mode Fiber Laser operating at wavelengths between 1050nm and 1120 nm. The Raman shifter employs two advanced technologies in a cascaded Raman resonator cavity: Bragg fiber gratings and WDM couplers. The resonator efficiently converts the input pump laser wavelength to the chosen output wavelength. An example could be 1064nm to 1480nm. The output is single mode

and randomly polarized although linearly polarized versions are available on request. Standard termination is a connector for output power $\leq 2W$ and bare fiber for power $>2W$.

All RLM Series lasers utilize broad stripe 1x100 μ m pump diodes operating at ~ 965 nm nominal wavelength. Expected lifetime of these preselected diodes is $>100,000$ hrs MTBF at 20°C. All pump diodes are subjected to intensive component qualification at IPG prior to installation.

Typical Specifications

Parameters	Unit	RLM-1-XXXX ²	RLM-5-XXXX ²	RLM-10-XXXX ²
Mode of operation		CW	CW	CW
Polarization ¹		random	random	random
Central emission wavelength ²	nm	1455	1455	1455
Nominal output power ³	W	1	5	10
Output power tunability	%	10-100	10-100	10-100
Output power instability: long term (over 8 hrs)	%	1	1	2
Emission bandwidth	nm			
3dB (FWHM)		<1	<2	<3
10dB		<1.5	<3	<4
Suppression ratio ⁴	dB			
1050-1440		20	20	17
1500-1700		>50	>50	>50
In band power	%	97	97	95
Operating voltage, (DC)	V	12	24	48
Maximum power consumption (at 20°C)	W	<20	<80	<24
Dimensions ⁵				
Version 1	mm	180x145x40	180x145x40	180x145x40
Weight	kg	2	4	5

¹ - Linear polarization is available on request

² - Wavelength could be selected anywhere in 1100-1700nm range

³ - Higher power up to 30W is available on request

⁴ - Higher suppression ratio is available on request

⁵ - Bench-Top and 19" rack mountable versions of package are available in RLD and RLR series

NOTE: Specifications and operating parameters can be matched to the customers requirements. Contact IPG with your requirements.

General Environmental Parameters

Parameter	Unit	Min.	Max.
Operating temperature *	°C	0	+45
Storage temperature	°C	-40	+75
Humidity	%	5	95
Warm up time	min		1
Cooling		forced air/heatsink	

Options

- Wavelength Selection
- Linear Polarization
- Output Power up to 30W CW

Optional AC/DC Laser Driver

Parameter	Unit	
AC power line	V	100/110/220/240
Output power display		digital
Output power control		panel or RS232
Dimensions	mm	250x100x260

- Output Termination
- Packaging
- Electrical Power Requirements

CAUTION: USE OF CONTROLS, ADJUSTMENTS AND PROCEDURES OTHER THAN THOSE SPECIFIED MAY RESULT IN HAZARDOUS LASER RADIATION EXPOSURE.

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