

# QLM4F02-48536678 series

4 wavelength multiplexing module of 488 532 660 and 785nm

**Preliminary**

C00254-05 July 2021



## 1. DESCRIPTION

The QLM04F02-48536678 is a 4 wavelength multiplexing module combined one compact visible laser and 3 TO-CANs with fiber output. The module includes TEC controller, and a highly airtight package.

## 2. FEATURES

- 4 wavelength of 488, 532, 660 and 785nm
- 532nm visible laser using frequency doubling technology
- Front power monitor for 532 nm laser available
- 3 TO56s of 488, 660 and 785nm direct semiconductor lasers including monitor PD
- Fiber output from polarization maintaining fiber
- Highly airtight package with a TEC

## 3. APPLICATIONS

- Fluorescence microscope
- Spectroscopy
- Biomedical applications

## 4. ABSOLUTE MAXIMUM RATINGS

( $T_c = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATING	UNIT
TEC Drive Current	$I_{TEC}$	3	A
Thermistor Resistance (B=3250 K)	$R_{th}$	10 (+/-3%)	k $\Omega$
Operation Temperature	$T_c$	20 to 30	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-10 to 50	$^\circ\text{C}$
Storage Relative Humidity	RH	< 90 (no condensation)	%

Wavelength	PARAMETER	SYMBOL	RATING	UNIT
488 nm	Optical output power	$P_f$	30	mW
	LD reverse voltage	$V_{RLD}$	-	V
	LD reverse current	$I_{RLD}$	85	mA
	PD reverse voltage	$V_{RPD}$	5	V

Wavelength	PARAMETER	SYMBOL	RATING	UNIT
532 nm	Optical output power	$P_f$	30	mW
	DFB forward current	$I_{DFB}$	250	mA
	DFB forward voltage	$V_{DFB}$	2.5	V
	DFB reverse voltage	$V_{rDFB}$	2	V
	SOA forward current	$I_{SOA}$	320	mA
	SOA forward voltage	$V_{ISOA}$	3	V
	SOA reverse voltage	$V_{rSOA}$	2	V

Wavelength	PARAMETER	SYMBOL	RATING	UNIT
660 nm	Optical output power	$P_f$	30	mW
	LD reverse voltage	$V_{RLD}$	2	V
	PD reverse voltage	$V_{RPD}$	30	V

Wavelength	PARAMETER	SYMBOL	RATING	UNIT
785 nm	Optical output power	$P_f$	60	mW
	LD reverse voltage	$V_{RLD}$	2	V
	PD reverse voltage	$V_{RPD}$	30	V

**5. OPTICAL AND ELECTRICAL CHARACTERISTICS**

 ( $T_{LD} = 25^{\circ}\text{C}$ , unless otherwise specified)

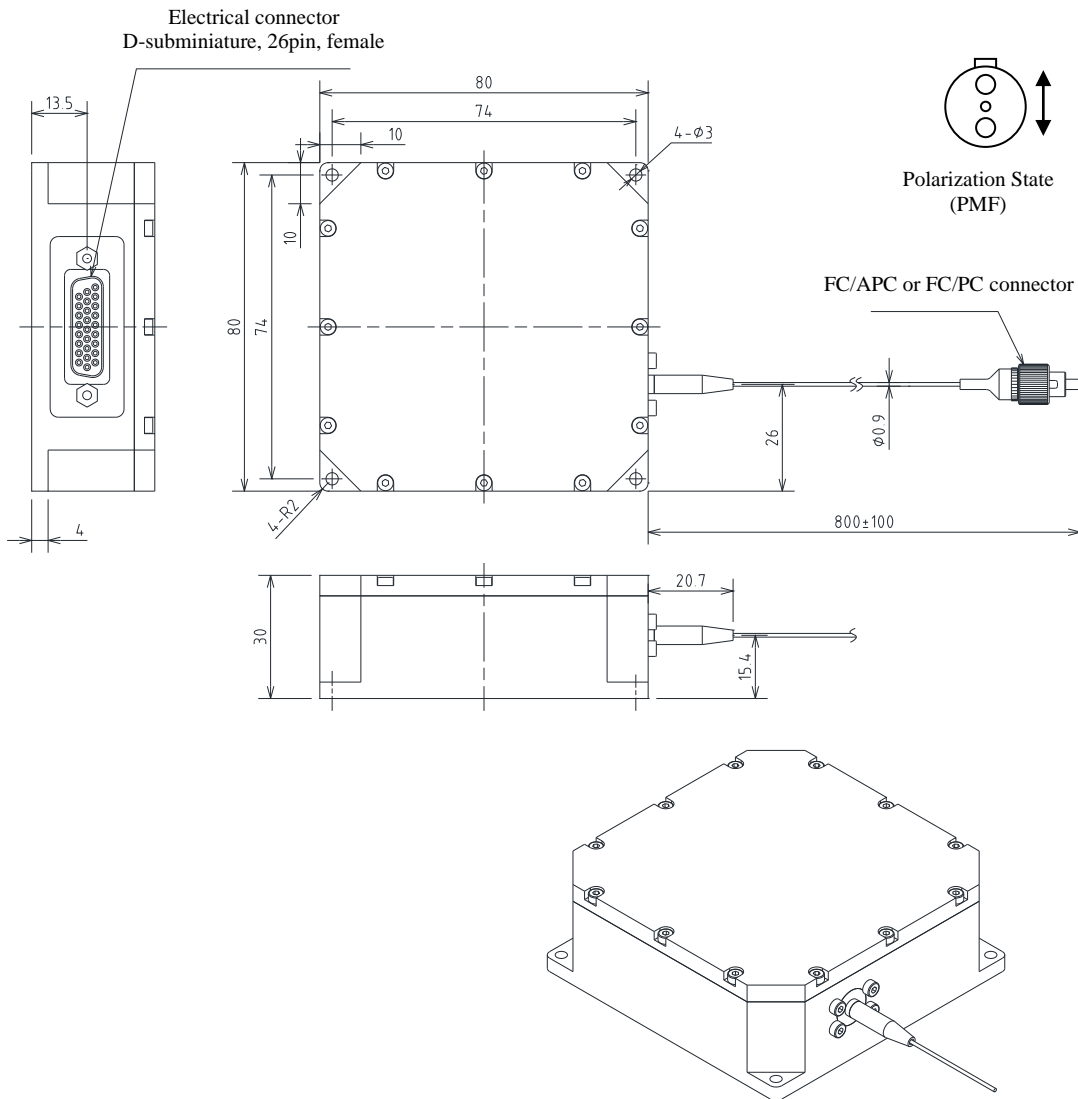
Wavelength	PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
488 nm	Threshold current	$I_{th488}$	CW	-	30	50	mA
	Operation current	$I_{op488}$	CW, $P_f=20$ mW	-	100	130	mA
	Operation voltage	$V_{op488}$	CW, $P_f=20$ mW	-	5.6	6.2	V
	Monitor current	$I_{m488}$	CW, $P_f=20$ mW, $V_{RD}=5$ V	200	1000	1800	$\mu\text{A}$
	Peak wavelength	$\lambda_{p488}$	CW, $P_f=20$ mW	483	488	493	nm
	Polarization Extinction Ratio	PER <sub>488</sub>	CW	-	20	-	dB

Wavelength	PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
532 nm	DFB operation current	$I_{opDFB}$	CW, $P_f= 20$ mW	-	120	220	mA
	DFB operation voltage	$V_{opDFB}$	CW, $P_f= 20$ mW	-	1.8	2.4	V
	SOA operation current	$I_{opSOA}$	CW, $P_f= 20$ mW	-	250	320	mA
	SOA operation voltage	$V_{opSOA}$	CW, $P_f= 20$ mW	-	2.0	3.0	V
	Front monitor current	$I_{m532}$	CW, $P_f=20$ mW, $V_{RD}=5$ V		TBD		$\mu\text{A}$
	Peak wavelength	$\lambda_{p532}$	CW, $P_f= 20$ mW	530	532	534	nm
	Polarization Extinction Ratio	PER <sub>532</sub>	CW	-	20	-	dB

Wavelength	PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
660 nm	Threshold current	$I_{th660}$	CW	-	55	70	mA
	Operation current	$I_{op660}$	CW, $P_f=20$ mW	-	100	135	mA
	Operation voltage	$V_{op660}$	CW, $P_f=20$ mW	-	2.3	2.8	V
	Monitor current	$I_{m600}$	CW, $P_f=20$ mW, $V_{RD}=5$ V	25	150	300	$\mu\text{A}$
	Peak wavelength	$\lambda_{p660}$	CW, $P_f=20$ mW	655	660	665	nm
	Polarization Extinction Ratio	PER <sub>660</sub>	CW	-	20	-	dB

Wavelength	PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
785 nm	Threshold current	$I_{th785}$	CW	-	35	55	mA
	Operation current	$I_{op785}$	CW, $P_f=40$ mW	-	135	190	mA
	Operation voltage	$V_{op785}$	CW, $P_f=40$ mW	-	2.2	2.8	V
	Monitor current	$I_{m785}$	CW, $P_f=40$ mW, $V_{RD}=5$ V	50	190	600	$\mu\text{A}$
	Peak wavelength	$\lambda_{p785}$	CW, $P_f=40$ mW	775	783	795	nm
	Polarization Extinction Ratio	PER <sub>785</sub>	CW	-	20	-	dB

6. OUTLINE DRAWING



**7. PIN ASSIGNMENT OF ELECTRICAL CONNECTOR**
**Electrical connector: D-subminiature, 26pin, female**

Pin No.	Function		Pin No.	Function	
1	488nm	LD Anode	19	WDM module Thermistor(+)	
2		LD Cathode	20	WDM module Thermistor(-)	
3		PD Anode	21	Cooler(+)	
4		PD Cathode	22	Cooler(+)	
5	660nm	LD Anode	23	Cooler(+)	
6		Short-Circuit	LD Cathode	24	Cooler(-)
7			PD Anode	25	Cooler(-)
8		PD Cathode	26	Cooler(-)	
9	NC				
10	785nm	LD Anode			
11		Short-Circuit	LD Cathode		
12			PD Anode		
13		PD Cathode			
14	532nm	Common Cathode (DFB,SOA)			
15		DFB Anode			
16		SOA Anode			
17		PD Anode			
18		PD Cathode			

**8. PRODUCT PART NUMBER**

Part Number	Fiber Type	Fiber Diameter	Connector
QLM4F02-48536678-1P	Polarization maintaining fiber	900um	FC/APC
QLM4F02-48536678-2P			FC/PC
QLM4F02-48536678-1S	Single mode fiber	900um	FC/APC
QLM4F02-48536678-2S			FC/PC

**9. NOTICE**

- Safety Information


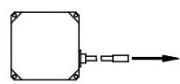

This product is classified as Class 3B laser product, and complies with 21 CFR Part 1040.10. Please do not take a look laser lighting in operations since laser devices may cause troubles to human eyes. Please do not eat, burn, break and make chemical process of the products since they contain GaAs material.

- Handling products

Semiconductor lasers are easily damaged by external stress such as excess temperature and ESD. Please pay attention to handling products, and use within range of maximum ratings. QD Laser takes no responsibility for any failure or unusual operation resulting from improper handling, or unusual physical or electrical stress.

- RoHS

This product conforms to RoHS compliance related Directive (EU) 2015/863.

 <p><b>DANGER</b></p>	<p>LASER DIODE</p> 
<p>VISIBLE AND/OR INVISIBLE LASER RADIATION AVOID DIRECTION EXPOSURE TO BEAM</p>  <p>MAXIMUM OUTPUT      300 mW WAVELENGTH            400~1000 nm CLASS III B LASER PRODUCT</p>	<p>AVOID EXPOSURE Laser Radiation is emitted from this aperture.</p>
<p>This product complies with 21 CFR Part 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007</p> <p><b>QD Laser, Inc.</b></p> <p>1-1 Minamiwataridacho, Kawasaki-ku, Kawasaki, Kanagawa, 210-0855 Japan</p>	



QD Laser, Inc.

Contact : [info@qdlaser.com](mailto:info@qdlaser.com)      <http://www.qdlaser.com>

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Address : Keihin Bldg. 1F 1-1 Minamiwataridacho, Kawasaki-ku, Kawasaki, Kanagawa Zip 210-0855 Japan

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