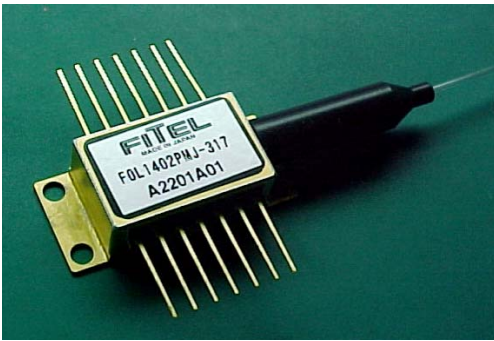


## 1480 / 14xx-nm Pump Laser Diode Module



### Applications

- Pump Source for Er-Doped Fiber Amplifier
  - C- and/or L-Band EDFA
  - Single Channel Amp to DWDM Amp
- Pump Source for Raman Amplifier

## Product Type : FOL1402P/1404Q/1405R/1425R Series

### Descriptions

- The FOL14xx series has been designed for use in a wide variety of optical amplifier, such as EDFA or Raman Amplifier used in optical transmission systems, especially in dense wavelength-division-multiplexing (DWDM) systems.
- A strained multi-quantum well laser diode chip is integrated with thermo-electric cooler (TEC), thermistor and PIN photodiode in a hermetically sealed 14 pin butterfly package.
- A 2-lens-system couples a round shape light from the laser chip efficiently to the fiber and enables the output power up to 400 mW.
- This laser module complies with telecom requirements described in Telcordia™ GR-468 requirement and manufactured in an ISO™9001 certified production line.

### Features

- Rated output power up to 400 mW (CW)
- Widely deployed reliable package design with industry compatible 14 pin butterfly footprint
- Internal Thermo-electric cooler (TEC) and Thermistor for stable operation
- Integrated PIN photodiode for back facet monitor
- Internal optical Isolator (optional)
- Single mode fiber and Polarization maintaining fiber pigtail
- Wavelength stabilization available with external FBG (optional)
- Epoxy free design inside the module for long term reliability
- EU RoHS compliant (Exemption 7b applied)

## Absolute Maximum Rating

Parameters	Sym.	Min.	Max.	Unit
Storage Temperature	Tstg	-40	85	°C
Operating Case Temperature 1402P(except for PNx) 1402PNx, 1404Q,1405R,1425R	Tc	-20 -20	75 70	°C
LD Forward Current 1402P 1404Q 1405R 1425R	If	- - - -	1000 1300 1600 1700	mA
LD Reverse Voltage	Vr	-	2	V
PD Forward Current	IfPD	-	5	mA
PD Reverse Voltage	VrPD	-	20	V
TEC Current 1402P 1404Q 1405R,1425R	Ic	-0.6 -1.1 -1.1	2 4.5 4.5	A
TEC Voltage 1402P 1404Q 1405R,1425R	Vc	- - -	4.5 4.2 4.5	V

## Specifications

(LD Temperature (Ts) = 25°C)

Parameters	Sym.	Min.	Typ.	Max.	Unit	Conditions
Output Power <sup>1)</sup>	Pf	Table A			mW	
Forward Current	If	Table A				
Center Wavelength(FP)	$\lambda$	1460	-	1490	nm	RMS(-20dB), Rated Power $\lambda=1420\sim 1510\text{nm}$ for FBG
Center Wavelength(FBG)		$\lambda-1.5$	$\lambda$	$\lambda+1.5$		
Spectral Width(-317 and -417)	$\Delta\lambda$	-	-	8	nm	RMS(-20dB), Rated Power
Spectral Width(-617) <sup>2)</sup>	$\Delta\lambda$	-	-	3		
Forward Voltage	Vf	Table A			V	Rated Power
Forward Current at EOL	IfEOL	-	-	1.2xIfBOL	mA	
Monitor Current 1402P 1404Q 1405R,1425R	Im	50 50 100	- - -	1000 1500 2000	$\mu\text{A}$	VrPD=5V, Rated Power
Monitor Dark Current	Id	-	-	100	nA	VrPD=5V
Extinction Ratio	Re	16	-	-	dB	-417 or -617 <sup>3)</sup>
Isolation	Iso	30	-	-	dB	-317 or -417 <sup>3)</sup>
TEC Specification	-	Table A				
Thermistor Resistance	Rth	9.5	10	10.5	k $\Omega$	Ts = 25°C
Thermistor B Constant	Bth	-	3900	-	-	Ts = 25°C

1) Pf: Available Pf may depend upon center wavelength selected.

2)  $\lambda$ c: Selected center wavelength from 1420nm to 1510nm available.

3) Design Description (See Table A and Ordering Information for detail)

Part Number	Build-in Isolator	External FBG	SM fiber	PM fiber
FOL14xxxxx-317	<b>X</b>		<b>X</b>	
FOL14xxxxx-417	<b>X</b>			<b>X</b>
FOL14xxxxx-617-xxxx		<b>X</b>		<b>X</b>

# Data Sheet

## FOL14xx Series

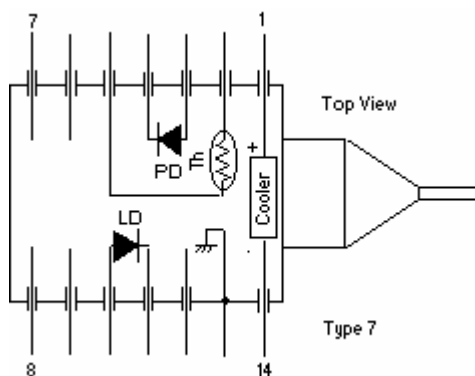
Feb. 2010



### Table A

Part Number	Pf(mW)	If(mA)	Vf(V)	Tc(°C)	Itec(A)	Vtec(V)	Wtotal(W)
FOL1402PJX	120	500	2.5	75	1.2	2.7	4.0
FOL1402PJY	130	500	2.5	75	1.2	2.7	4.0
FOL1402PLZ	140	600	2.5	75	1.3	3.0	5.1
FOL1402PLE	150	600	2.5	75	1.3	3.0	5.1
FOL1402PLF	160	600	2.5	75	1.3	3.0	5.1
FOL1402PMG	170	700	2.5	75	1.5	3.5	6.8
FOL1402PMH	180	700	2.5	75	1.5	3.5	6.8
FOL1402PMI	190	700	2.5	75	1.5	3.5	6.8
FOL1402PNJ	200	800	2.5	70	1.7	3.6	7.8
FOL1404QPK	210	900	2.5	70	2.7	2.5	8.7
FOL1404QPL	220	900	2.5	70	2.7	2.5	8.7
FOL1404QPM	230	900	2.5	70	2.7	2.5	8.7
FOL1404QQN	240	1000	2.5	70	3.0	2.7	10.5
FOL1404QQO	250	1000	2.5	70	3.0	2.7	10.5
FOL1404QQP	260	1000	2.5	70	3.0	2.7	10.5
FOL1405RSA	270	1200	2.6	70	2.7	3.4	12.3
FOL1405RSB	280	1200	2.6	70	2.7	3.4	12.3
FOL1405RTC	290	1300	2.6	70	2.9	3.7	14.1
FOL1405RTD	300	1300	2.6	70	2.9	3.7	14.1
FOL1405RTV	320	1300	2.6	70	2.9	3.7	14.1
FOL1425RTW	340	1300	2.7	70	2.9	3.7	14.1
FOL1425RTX(-317,-417)	360	1300	2.7	70	2.9	3.7	14.1
FOL1425RUX(-617)	360	1400	2.7	70	3.2	4.0	16.5
FOL1425RUY(-317,-417)	380	1400	2.7	70	3.2	4.0	16.5
FOL1425RUZ(-317,-417)	400	1400	2.7	70	3.2	4.0	16.5

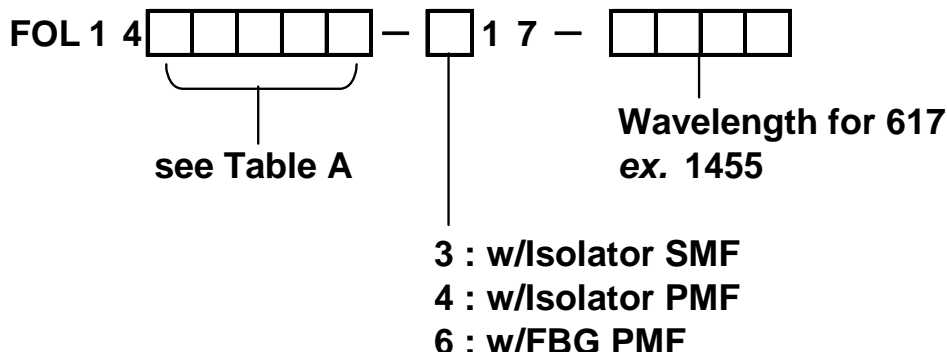
### Pin Assignment



Pin#	Function	Pin#	Function
1	Cooler(+)	8	No Connection
2	Thermistor	9	No Connection
3	PD anode(-)	10	LD anode(+)
4	PD cathode(+)	11	LD cathode(-)
5	Thermistor	12	No Connection
6	No Connection	13	Case GND
7	No Connection	14	Cooler(-)



**Ordering information**



**Safety information**

This product complies with 21 CFR 1040.10 and 1040.11, Class 3b laser product. Invisible laser radiation is emitted from the end of the fiber or connector. Avoid direct exposure to the beam.



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