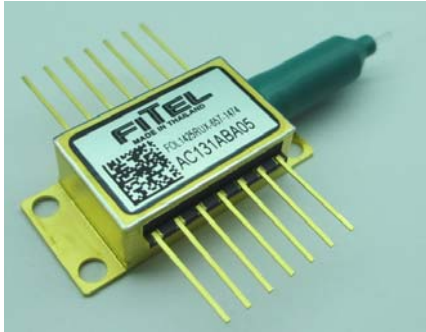


14xx-nm Pump Laser Diode Module (with FBG)



Applications

- Pump Source for Raman Amplifier
 - C/L-band Raman

Product Type : FOL1404Q/1405R/1425R Series

Descriptions

- The FOL14xx series (with FBG) has been designed for use in a wide variety of optical amplifier, such as 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 360 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 360 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
- Polarization maintaining fiber pigtail
- Wavelength stabilization available with external FBG
- EU RoHS compliant (Exemption 7(c)-1, 13(a) applied)

Absolute Maximum Rating

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

Specifications

(LD Temperature (Ts) = 25°C)

Parameters	Sym.	Min.	Typ.	Max.	Unit	Conditions
Output Power ¹⁾	Pf	Table A			mW	
Forward Current	If	Table A				
Center Wavelength	λ	$\lambda-1.5$	λ	$\lambda+1.5$	nm	RMS(-20dB), Rated Power $\lambda=1400\sim 1500\text{nm}$ for FBG
Spectral Width	$\Delta\lambda$	-	-	3	nm	RMS(-20dB), Rated Power
Forward Voltage	Vf	Table A			V	Rated Power
Forward Current at EOL	IfEOL	-	-	1.2xIfBOL	mA	
Monitor Current	Im	100	-	1500	μA	VrPD=5V, Rated Power
1404Q 1405R, 1425R		100	-	2000		
Monitor Dark Current	Id	-	-	100	nA	VrPD=5V
Extinction Ratio	Re	16	-	-	dB	
TEC Specification	-	Table A				
Thermistor Resistance	Rth	9.5	10	10.5	k Ω	Ts = 25°C
Thermistor B Constant	Bth	-	3900	-	-	Ts = 25°C

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

FOL14xx Series

(with FBG, $\lambda=1400-1500\text{nm}$)

Apr. 2016

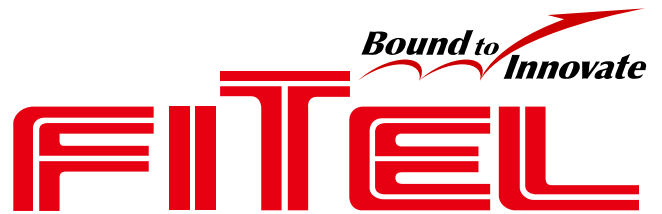
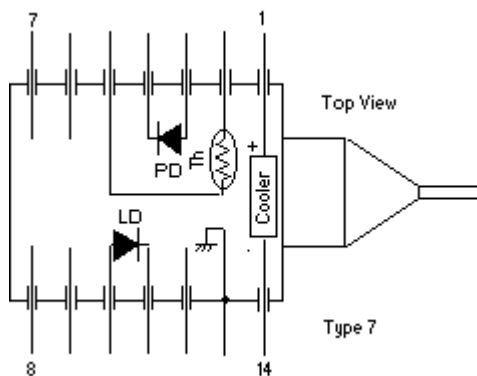


Table A

*:EOL

Part Number	Pf(mW)	If(mA) max	Vf(V) max	Tc(°C)	Itec(A)* max	Vtec(V)* max	Wtotal(W)* max
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
FOL1425RUX	360	1400	2.7	70	3.2	4.0	16.5

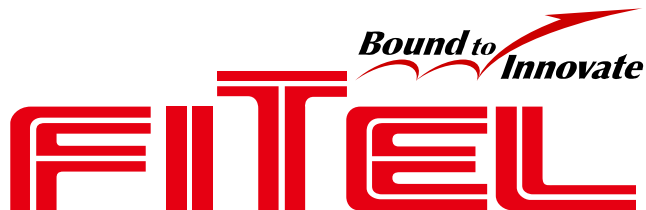
Pin Assignment



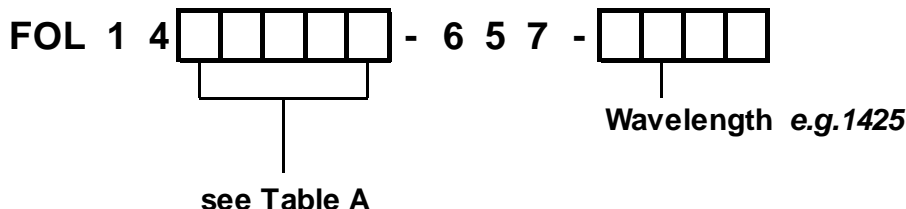
Pin#	Function	Pin#	Function
1	Cooler(+)	8	No Connection
2	Thermistor	9	No Connection
3	PD anode(-)	10	LD anode(+)
4	PD cathode(+)	11	LD cathode(-)
5	Thermistor	12	No Connection
6	No Connection	13	Case GND
7	No Connection	14	Cooler(-)

FOL14xx Series (with FBG, $\lambda=1400-1500\text{nm}$)

Apr. 2016



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.



ISO is a trademark of The International Organization for Standardization.

Telcordia is a trademark of Telcordia Technologies, Inc.

Furukawa Electric reserves the right to improve, enhance and modify the features and specifications of FITELE products without prior notifications.

FURUKAWA ELECTRIC CO., LTD.

Japan
Head Office
 2-2-3, Marunouchi
 Chiyoda-ku
 Tokyo 100-8322,
 JAPAN
 Tel: +81-3-3286-3253
 Fax: +81-3-3286-3978
<http://www.furukawa.co.jp>

North America
OFS
 1 Brightwave Blvd.
 Carrollton, GA 30117, USA
 Tel: +1-770-798-5555
<http://www.ofsoptics.com>
 E-mail: info@ofsoptics.com

Europe
Furukawa Electric Europe Ltd.
 Furukawa House
 77-85 Fulham Palace Road,
 London W6 8JD, United Kingdom
 Tel: +44-20-7313-5300
 Fax: +44-20-7313-5310
<http://www.furukawa.co.uk>
<http://www.furukawa.co.uk/contactus.php>

ASIA
Furukawa Electric Hong Kong Ltd.
 Suite 1810, 18/F, Tower 2,
 33 Canton Road, China Hong Kong City
 Tsim Sha Tsui, Kowloon, Hong Kong
 Tel: 852-2512-8938
 Fax: 852-2512-9717
<http://www.fehk.com.hk/>
 E-mail: guest@fehk.cn