

Active Components Pump Laser Modules

1948RxB - Datasheet

RCL IMA DSH 000 00093

Key Features

- Operating Power up to 600mW
- Ultra-Low Power Consumption
- Operating Temperature from -5°C to 70°C
- Wavelength stabilization with FBG on PMF pigtail
- Integrated Thermo-Electric Cooler, Thermistor
- Telcordia GR-468-CORE qualified
- RoHs 6/6

Applications

Raman Amplifier

14xx/15xx nm Ultra-Low Power Consumption Pump Laser Module

The 1948RxB is a family of new generation of Ultra-Low Power Consumption 14xx/15xx nm pump module designed for Raman amplification, powered by an in-house chip technology leading to outstanding level of performance, power consumption and reliability.

Low Profile 14-pin butterfly modules are available with operating power up to 600mW over a wavelength range from 1420nm to 1510nm and an extended case temperature range from -5°C to 70°C. They incorporate a thermoelectric cooler (TEC) and a precision NTC thermistor. In addition, a linear back-facet monitoring Photodiode allows for a precise diagnostic of the pump working behavior.

The wavelength is locked utilizing a Fiber Bragg Grating (FBG) located in a single mode Polarization Maintaining Fiber (PMF).

The module meets Telcordia™ GR-468-Core requirements for hermetic 14xx/15xx nm pump modules.

- | | | |
|----------------|-----------------------|----------|
| 1948RMB | Raman Medium Power | up 400mW |
| 1948RHB | Raman High Power | up 500mW |
| 1948RVB | Raman Very-High Power | up 600mW |

Contact Info

Please contact us at:

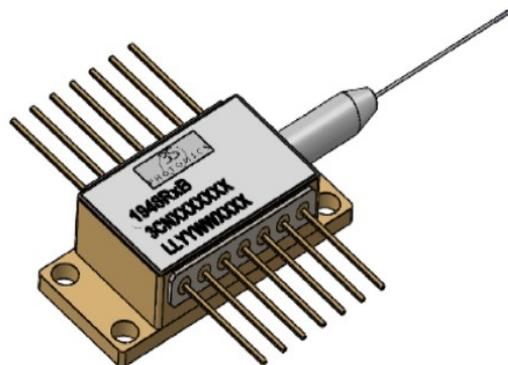
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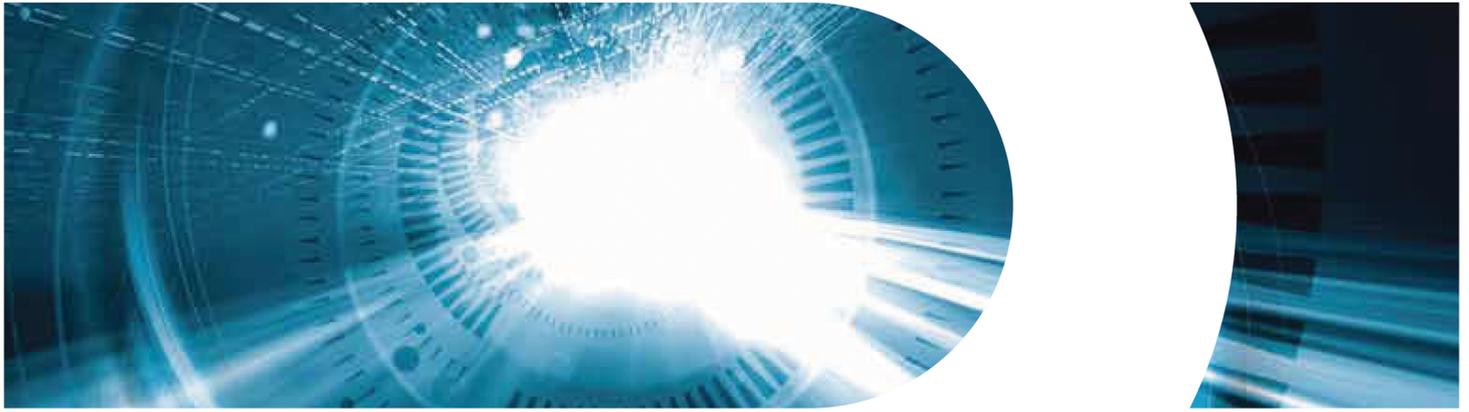
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ELECTRO-OPTICAL CHARACTERISTICS

The following parameters are specified BOL for $T_{SUB}=35^{\circ}C$, $T_{CASE}=-5$ to $70^{\circ}C$, $T_{FBG}=25^{\circ}C$, unless otherwise stated.

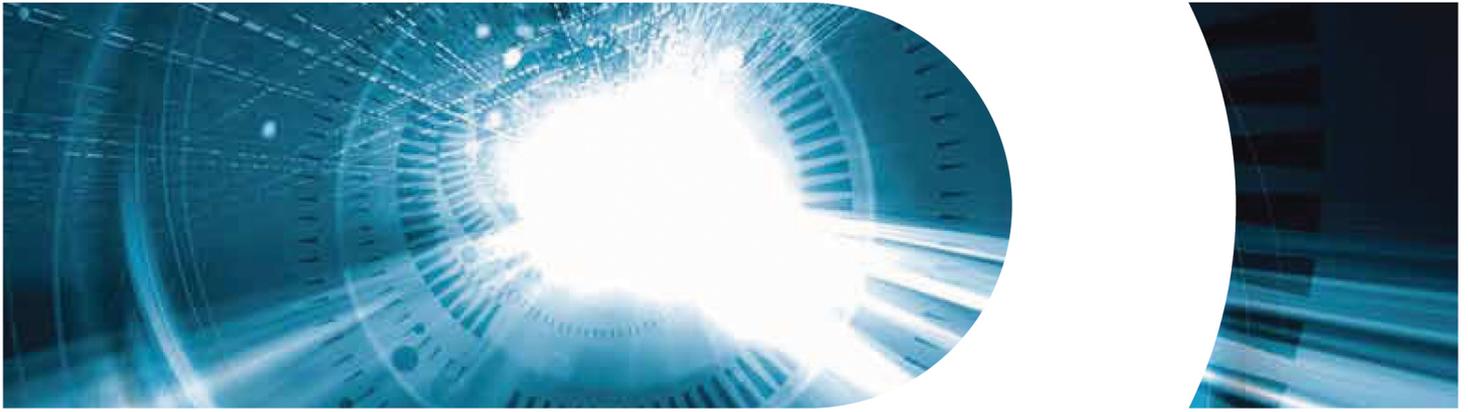
Parameter	Symbol	Test Condition	Minimum	Maximum
Target Wavelength	λ	Specified by the customer	1420nm	1510nm
Center Wavelength Deviation	λ_c	P_{OP}	-0.5nm	+0.5nm
Operating Pump Powers	P_{OP}		300mW	600mW
Min Operating Pump Powers	P_{min}		100mW	
Power In Band	PIB	$\lambda \pm 2nm, P_{OP}$	80%	
Spectrum Bandwidth	$\Delta\lambda_{RMS}$	$P_{OP}, RMS (-20dB)$	0.25nm	2nm
Polarization Extinction Ratio	PER	P_{OP}	13dB	
Threshold Current	I_{th}			220mA
Relative Intensity Noise	RIN	100KHz<f<1GHz, $P_{min}<P<P_{OP}$		-105dB/Hz
Side Mode Suppression Ratio	SMSR	P_{OP}	20dB	
Wavelength Temperature Dependence				0.015nm/ $^{\circ}C$
Thermistor Resistance	R_{th}	$T_{sub} = 25^{\circ}C$	9.5k Ω	10.5k Ω
		$T_{sub} = 35^{\circ}C$	6.2k Ω	6.86k Ω
Thermistor B Constant	B		3700K	4100K

MONITORING PHOTODIODE

Parameter	Symbol	Test Condition	Minimum	Maximum
Monitor PD Responsivity		$V_{RPD}=5V, P_{OP}$	0.2 $\mu A/mW$	10 $\mu A/mW$
Dark Current	I_d	$V_{RPD}=5V$		100nA
Monitor Capacitance	C_m	$V_{RPD}=5V, f=1MHz$		15pF
Tracking Ratio	TR	100mW < P < P_{OP} , I_m const.	0.85	1.15
Tracking Error	TE	I_m constant, Pop	-10%	10%

WAVELENGTH TABLE

λ (nm)	##								
1420,00	CY	1438,00	EL	1456,00	FY	1474,00	HL	1492,00	JY
1421,00	DA	1439,00	EN	1457,00	GA	1475,00	HN	1493,00	KA
1422,00	DC	1440,00	EQ	1458,00	GC	1476,00	HQ	1494,00	KC
1423,00	DE	1441,00	ES	1459,00	GE	1477,00	HS	1495,00	KE
1424,00	DG	1442,00	EU	1460,00	GG	1478,00	HU	1496,00	KG
1425,00	DJ	1443,00	EW	1461,00	GJ	1479,00	HW	1497,00	KJ
1426,00	DL	1444,00	EY	1462,00	GL	1480,00	HY	1498,00	KL
1427,00	DN	1445,00	FA	1463,00	GN	1481,00	JA	1499,00	KN
1428,00	DQ	1446,00	FC	1464,00	GQ	1482,00	JC	1500,00	KQ
1429,00	DS	1447,00	FE	1465,00	GS	1483,00	JE	1501,00	KS
1430,00	DU	1448,00	FG	1466,00	GU	1484,00	JG	1502,00	KU
1431,00	DW	1449,00	FJ	1467,00	GW	1485,00	JJ	1503,00	KW
1432,00	DY	1450,00	FL	1468,00	GY	1486,00	JL	1504,00	KY
1433,00	EA	1451,00	FN	1469,00	HA	1487,00	JN	1505,00	LA
1434,00	EC	1452,00	FQ	1470,00	HC	1488,00	JQ	1506,00	LC
1435,00	EE	1453,00	FS	1471,00	HE	1489,00	JS	1507,00	LE
1436,00	EG	1454,00	FU	1472,00	HG	1490,00	JU	1508,00	LG
1437,00	EJ	1455,00	FW	1473,00	HJ	1491,00	JW	1509,00	LJ
								1510,00	LL



ABSOLUTE MAXIMUM RATINGS

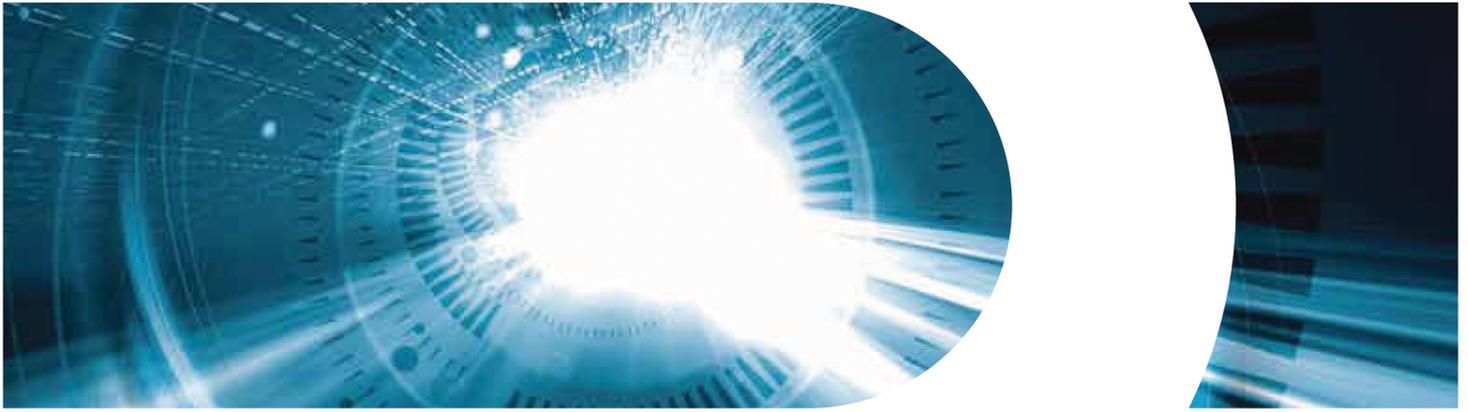
Exposing this device to stresses and conditions above those listed in this section could cause permanent damage and affect reliability. The device is not meant to operate outside the operational limits described in previous section at any length of time.

Parameter	Symbol	Test Condition	Minimum	Maximum
Operating Case Temperature	T _{OP}	No cold start. TEC will be turned-on first	-5°C	70°C
Operating FBG Temperature	T _{FBG}		-5°C	70°C
Storage Temperature	T _{STG}		-40°C	75°C
Relative Humidity	RH	40°C not condensing	0%	95%
Lead Soldering Temperature		10s maximum		300°C
LD Reverse Voltage	V _r			2V
LD Forward Current	I _f	P _{OP} < 400mW		2500mA
		400mW ≤ P _{OP} ≤ 500mW		3000mA
		P _{OP} > 500mW		3200mA
LD Reverse Current	I _{rev}			10μA
LD ESD	V _{ESD}	HBM C=100pF, R=1.5kΩ		500V
MPD Reverse Voltage	V _{RPD}			20V
MPD Forward Current	I _{FPD}			10mA
TEC Current	I _{TEC}		-2A	4A
TEC Voltage	V _{TEC}		-2V	4.5V
Thermistor Current	I _{th}			5mA
Fiber Tensile Load		10sec Max		5.0N
Fiber Bend Radius			16mm	

POWER CONSUMPTION

The following parameters are specified for T_{SUB}= 35°C, T_{CASE}=70°C, T_{FBG}=25°C unless otherwise stated. I_{OP EOL}= I_{OP BOL} X 1,15.

Wavelength	Power	Pump	Max Laser Diode Forward Current	Max Laser Diode Forward Voltage	Max TEC Current	Max TEC Voltage	Max Total Power Consumption
			I _{OP} (A) BOL	V _{OP} (V) BOL	I _{TEC} (A) EOL	V _{TEC} (V) EOL	P _{TOT} (W) EOL
1420-1470nm	300mW	1948RMB	1,40	1,70	1,30	2,30	4.50
	360mW	1948RMB	1,60	1,90	1,55	2,50	5.50
	380mW	1948RMB	1,65	1,95	1,60	2,55	6.00
	400mW	1948RMB	1,67	2,00	1,65	2,60	6.50
	430mW	1948RHB	1,85	1,85	1,75	2,25	7.50
	450mW	1948RHB	1,90	1,90	1,80	2,30	8.00
	500mW	1948RHB	2,10	2,00	2,20	2,50	9.00
	550mW	1948RVB	2,30	2,05	2,10	3,20	10.5
	600mW	1948RVB	2,50	2,10	2,35	3,50	12.5
1471-1510nm	300mW	1948RMB	1,50	1,80	1,40	2,40	5.30
	360mW	1948RMB	1,65	1,95	1,60	2,55	6.50
	380mW	1948RMB	1,67	2,00	1,65	2,60	7.00
	400mW	1948RMB	1,75	2,10	1,70	2,65	7.50
	430mW	1948RHB	1,90	1,90	1,80	2,30	9.00
	450mW	1948RHB	2,10	2,00	2,20	2,50	9.50
	500mW	1948RHB	2,20	2,10	2,30	2,60	11.0
	550mW	1948RVB	2,50	2,15	2,25	3,40	12.5

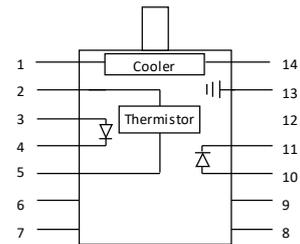


FIBER PIGTAIL CHARACTERISTICS

Parameter	Minimum	Typical	Maximum
Fiber	Fujikura PMF or equivalent		
FBG To Fiber End	500mm		
FBG Center From Module		2500mm	
FBG Recoating Diameter		250µm	
Pigtail Length		3400mm	
Fiber Connector		None	

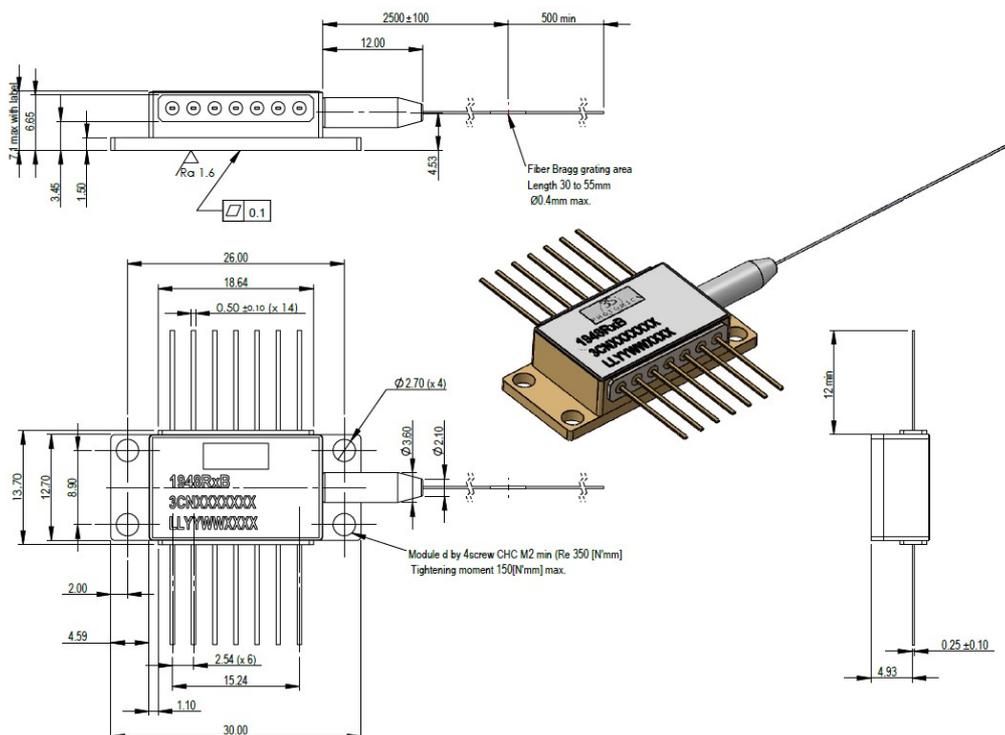
PIN ASSIGNMENT

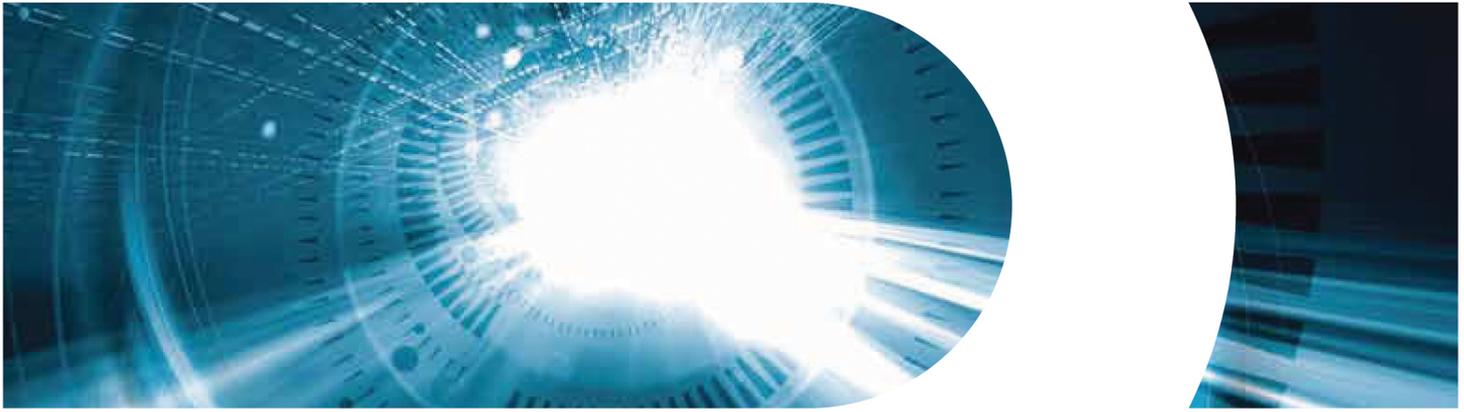
N°	Description	N°	Description
1	TEC (+)	14	TEC (-)
2	Thermistor (TS)	13	Case Ground
3	PD node (-)	12	N/C
4	PD Cathode (+)	11	Laser Diode Cathode (-)
5	Thermistor (TS)	10	Laser Diode Anode (+)
6	N/C	9	N/C
7	N/C	8	N/C



MECHANICAL DETAILS

Dimensions are in mm.





LASER SAFETY INFORMATION

This laser module emits invisible light. Take appropriate precautions to prevent undue exposure to naked eye when module is in operation. This product is classified Class 4 Laser Product according to IEC-60825-1.

HANDLING

This product is sensitive to handling. Handle the module by its package only. Never hold it by its pigtail. Care should be taken to avoid supply transient currents and voltages. Drive voltage above the maximum specified in absolute maximum rating section electrostatic discharge and should not be handled except at a static free workstation. Take precautions to prevent ESD; use wrist straps, grounded work surfaces and recognized anti-static techniques when handling the product may cause permanent damage to the device.



APPLICATION NOTE

In order to prevent any mishandling, misuse, neglect or accident, it is highly recommended to read and follow the instructions detailed in the application note: [RCL IMA APN 000 00007 "Handling, Mounting, Testing and Operating Cooled 14-pin Butterfly Laser Pumps"](#).

ORDERING INFORMATION

Operating Power	3SP Part Number	Pump Name
300mW	3CN01830##	1948RMB
320mW	3CN01832##	1948RMB
340mW	3CN01834##	1948RMB
360mW	3CN01836##	1948RMB
380mW	3CN01838##	1948RMB
400mW	3CN01840##	1948RMB
430mW	3CN01843##	1948RHB
450mW	3CN01845##	1948RHB
480mW	3CN01848##	1948RHB
500mW	3CN01850##	1948RHB
550mW	3CN01955##	1948RVB
600mW	3CN01960##	1948RVB

refers to wavelength table. Other Powers are available upon request.

IMPORTANT NOTICE

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