

# CM97-xxx-7x

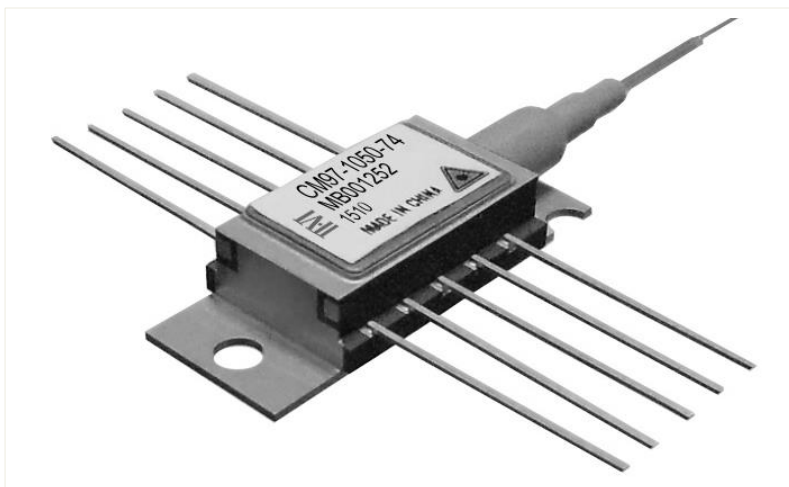
## Cooled 980nm Pump Laser Module

### Features

- High output power, >1.0W kink free
- Fiber Bragg grating stabilization for wavelength locking over the entire operating conditions
- Hermetically sealed 10pin mini-butterfly package
- Internal thermoelectric heatpump and monitor photodiode
- Telcordia GR-468-CORE compliant
- Field-proven high reliability
- RoHS compliant

### Applications

- Low noise EDFAs
- Dense wavelength division multiplexing (DWDM) EDFAs
- CATV Applications



### Product Overview

These lasers are designed as pump sources for erbium doped fiber amplifier (EDFA) applications. Processes and techniques of coupling the fiber to the laser allow very high output powers that are stable with both time and temperature.

The CM97-series pump module utilizes a fiber Bragg grating design for enhanced wavelength and power stability performance. This product has been designed to ensure superior wavelength locking over drive current and case temperature.

Devices are available with kink free output powers to >1.0W.

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## Optical Characteristics

Product Code	Kink-Free Power $P_{\text{kink}}$ (mW)	Operating Power $P_{\text{op}}$ (mW)	Maximum Operating Current $I_{\text{op}}$ (mA)
CM97-610-7*	610	555	855
CM97-630-7*	630	570	885
CM97-650-7*	650	590	915
CM97-670-7*	670	610	940
CM97-690-7*	690	625	970
CM97-710-7*	710	645	995
CM97-730-7*	730	665	1030
CM97-750-7*	750	680	1050
CM97-770-7*	770	700	1080
CM97-790-7*	790	720	1105
CM97-810-7*	810	735	1135
CM97-830-7*	830	755	1165
CM97-850-7*	850	775	1190
CM97-870-7*	870	790	1215
CM97-890-7*	890	810	1245
CM97-910-7*	910	830	1275
CM97-930-7*	930	845	1300
CM97-950-7*	950	865	1330
CM97-970-7*	970	880	1360
CM97-990-7*	990	900	1360
CM97-1010-7*	1010	920	1360
CM97-1030-7*	1030	935	1360
CM97-1050-7*	1050	955	1360

## Wavelength Specification

Product Code	Min.	Typ.	Max.	Units	Condition
CM97-xxx-74	973	974	975	nm	Air reference. FBG temperature is @ 25°C.
CM97-xxx-76	975	976	977		

### Notes;

1. Conditions unless otherwise stated: Case temperature -20 to 75°C, Submount temperature 25°C (at any given case temperature), Monitor diode bias -5V, CW operation
2. Operating power assumes a 10% ageing margin: Operating Power = Kink-Free Power/1.1

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## Product Specification

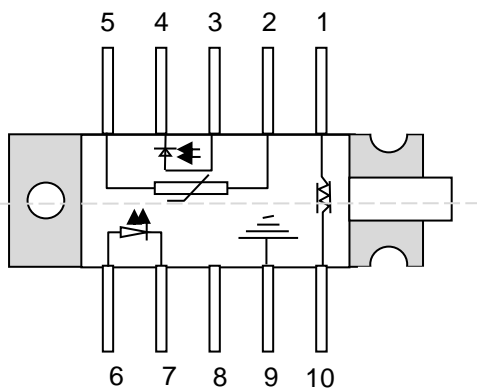
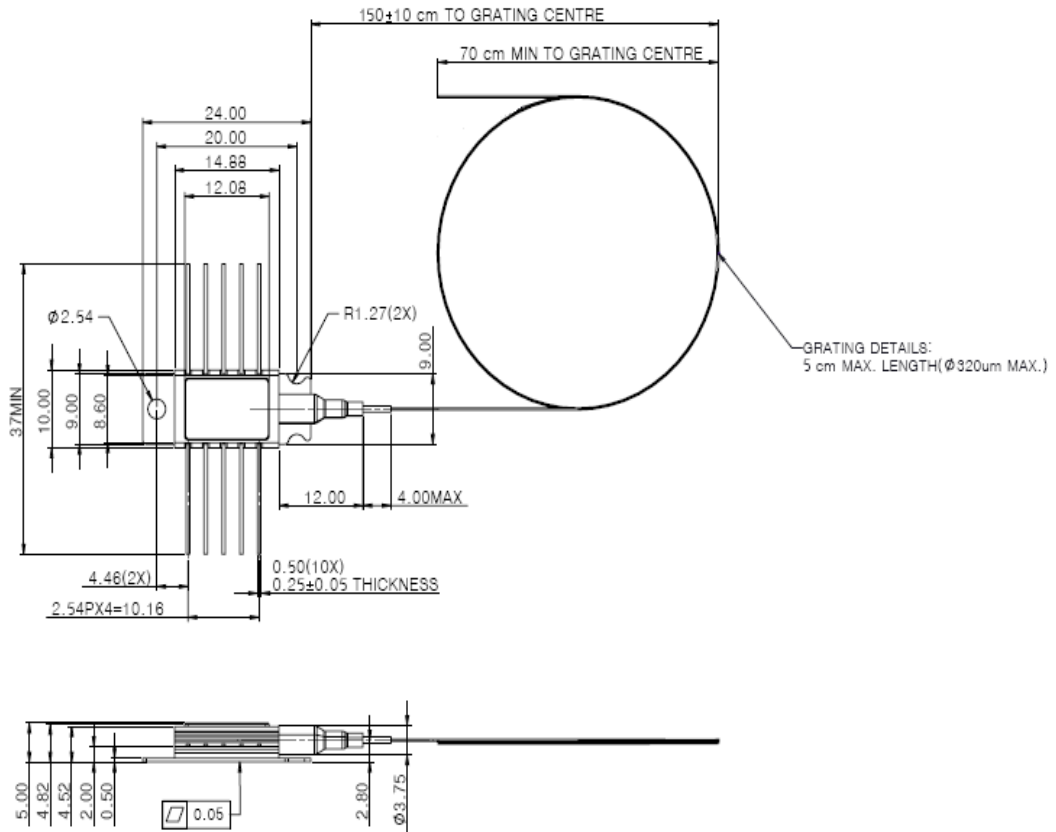
Parameter		Min.	Typ.	Max.	Units	Condition
Threshold current	$I_{th}$		60	80	mA	
Maximum Kink Free Current	$I_{kink} @ P_{kink}$			1500	mA	
Operating forward voltage	$V_{op}$		2.0	2.2	V	
Spectral width	$\Delta\lambda$		0.2	1.0	nm	RMS at -13dB
Signal to noise ratio	SNR	20			dB	
Temperature dependence of peak wavelength	$\Delta\lambda/\Delta T$		0.008	0.01	nm/°C	FBG temperature dependency
Monitor detector responsivity	$R_m$	1		10	$\mu A/mW$	@ -5V bias voltage
Monitor dark current	$I_{dark}$			50	nA	
Fibre power stability >50mW 30 – 50mW 10 – 30mW	$\Delta P_{f\_t}$			0.05 0.15 0.35	dB	Peak-to-peak Time = 60sec DC to 50kHz
Return loss	RL	8			dB	1500nm – 1600nm
Thermistor BETA value	$\beta$	3500	3575	4100		$\pm 1\%$ temperature variation
Thermistor resistance	$R_{th}$	9.5	10.0	10.5	k $\Omega$	At submount temperature of 25°C
Heat pump current	$I_{TEC}$			2.0	A	Tcase= 75°C, IF= 1500mA
Heat pump voltage	$V_{TEC}$			3.0	V	

## Absolute Maximum Rating

Parameter		Min.	Typ.	Max.	Units	Condition
Operating case temperature	$T_{op}$	-20		75	°C	
Storage temperature	$T_{stg}$	-40		85	°C	
Storage relative humidity	RHstg	5		95	%	But not to exceed 0.024kg of water per 1.0kg of dry air
Operating relative humidity	RHop	5		85	%	
Pigtail axial pull force				10.0	N	3x10 seconds
Pigtail side pull force				5.0	N	3x10 seconds
Fibre bend radius		13			mm	
Lead soldering temperature				350	°C	10 sec
Laser diode forward current	$I_{f\_max}$			1500	mA	CW
Laser diode current transient				1500	mA	Time = 1000ns max.
Laser diode reverse current	$I_r$			10	$\mu A$	
Laser diode reverse voltage	$V_r$			2.0	V	
Heat pump current	$I_{TEC}$	-2.5		2.5	A	Thermistor and TEC must be in closed loop control at all times
Heat pump voltage	$V_{TEC}$	-3.3		3.3	V	

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## Module Outline Drawing and Pin Connections



Pin	Description	Pin	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

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## Fibre Specification

Parameter	Min.	Typ.	Max.	Units	Condition
Fibre type	Corning HI1060				
Cut-off wavelength	870	920	970	nm	
Mode field diameter	5.6	5.9	6.2	µm	@ 980nm
Cladding diameter	124.5	125	125.5	µm	
Fibre coating diameter	230	245	260	µm	Acrylate material, mechanically strippable
Grating recoat diameter	260	280	320	µm	
Core/cladding concentricity			<0.5	µm	
Coating-clad offset			≤5	µm	
Fibre proof test	200			kpsi	
Fibre Bragg Grating proof test	150			kpsi	

**Note;** Fibre termination; bare fibre with rough cleave.

## Ordering Information

CM	97	-	xxx	-	7x
Product Type	Chip Type	-	Kink Free Power	-	Wavelength 74 for 974nm 76 for 976nm

**Example: CM97-550-74 is a 550mW KFP; 974nm product.**