



# SINGLE-MODE PUMP LASERS

600 mW, 700 mW Kink-Free Output Power Options

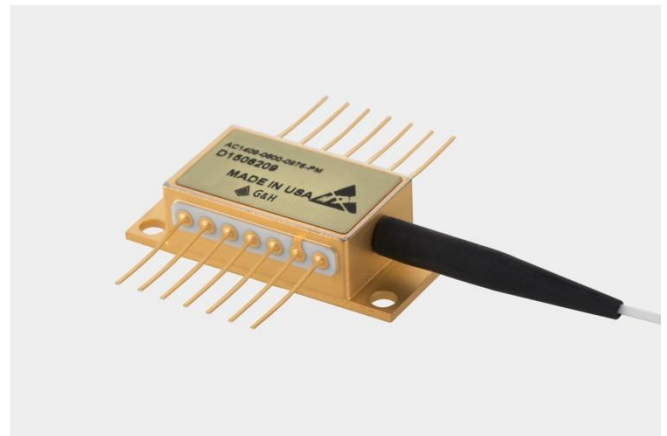
## AC1409 SERIES

The Gooch & Housego line of single-mode, cooled 980 nm pump lasers deliver >700 mW of kink-free fiber-coupled power. The modules are packaged using unique laser-weld packaging technology for high reliability over harsh operating conditions. Improved PER is achieved using advanced fiber pigtail construction techniques.

The hermetically sealed 14-pin butterfly package is available with a fiber Bragg grating and includes thermoelectric cooler, thermistor, monitor photodiode and UniDry™ getter. The fiber Bragg grating precisely locks the center wavelength over extended power and temperature range.

Center wavelengths in the range of 976 nm to 980 nm are available with tight wavelength control.

G&H's pump lasers are tested to meet the requirements outlined in Telcordia GR-468-CORE.



### Wavelengths Available

- 974, 976, 980 nm and custom wavelengths available

### Features

- Internal cooler and thermistor
- Optional fiber Bragg grating (FBG)
- Tested to Telcordia GR-468-CORE

### Applications

- Defense
- Industrial
- Life sciences

## Data tables

$T_{OP}=25^{\circ}\text{C}$ , continuous wave, and beginning of life unless otherwise specified.

Optical Characteristics	Sym	Condition	Min	Typ	Max	Unit
Operating chip temperature	$T_{CHIP}$		20		35	$^{\circ}\text{C}$
Operating power	$P_{OP}$	Kink free power = 700 mW		650		mW
		Kink free power = 600 mW		540		mW
Center wavelength	$\lambda_c$	$P=P_{OP}$	See ordering information			
Wavelength tolerance	$\Delta\lambda$	With FBG	-1		+1	nm
		Without FBG	-5		+5	nm
Spectral shift with temperature	$\Delta\nu$	With FBG		0.01		nm/ $^{\circ}\text{C}$
		Without FBG		0.30		nm/ $^{\circ}\text{C}$
PER		@ room temperature		17		dB
Power in band		@ $\lambda_c\pm 1\text{nm}$ , $P>50\text{mW}$	90			%

Electrical Characteristics	Sym	Condition	Min	Typ	Max	Unit
Threshold current	$I_{TH}$				80	mA
Laser drive current	$I_{OP}$	Kink free power = 700 mW		1000	1200	mA
		Kink free power = 600 mW		900	1200	mA
Laser forward voltage	$V_F$	$P=P_{OP}$		2.0	2.7	V
Monitor photo diode current	$I_{PD}$		0.1		6.0	mA
Monitor photo diode dark current	$I_D$				100	nA
TEC current		$T_{amb}=25^{\circ}\text{C}$ for typ		0.4	3.5	A
TEC voltage		$T_{amb}=75^{\circ}\text{C}$ for max		0.3	3.5	V
Thermistor resistance	$R_{TH}$	$T=25^{\circ}\text{C}$	9500	10000	10500	$\square$
Thermistor $\beta$ coefficient	$\beta$	0 / $50^{\circ}\text{C}$		3892		

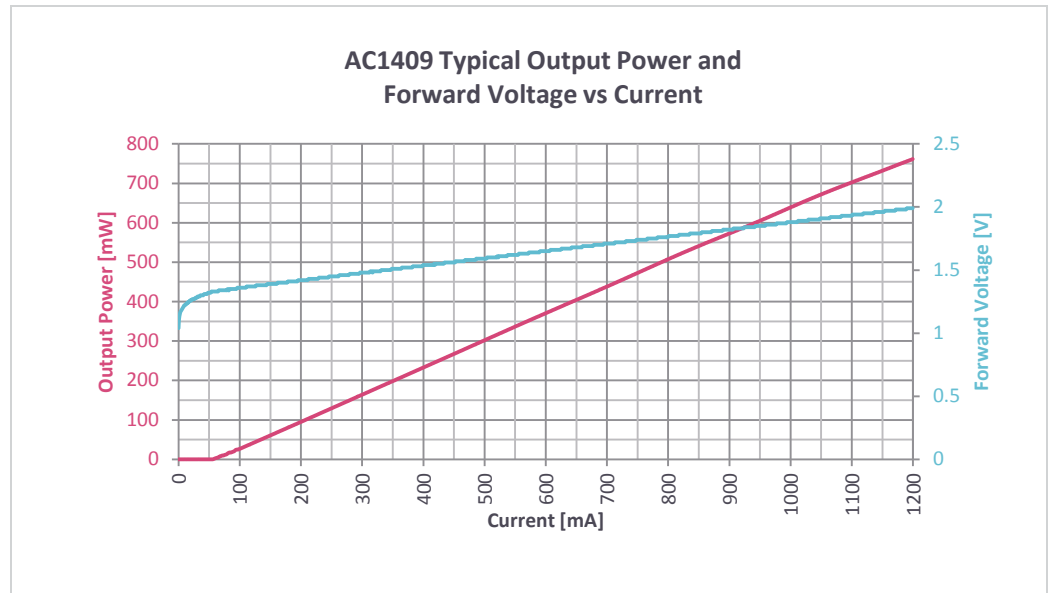
Fiber Characteristics	Min	Typ	Max	Unit
Fiber type, jacket material	PM, Hytel Acrylate			
Core diameter	5.6	6.6	7.6	$\mu\text{m}$
Cladding diameter	123	125	127	$\mu\text{m}$
Buffer diameter	230	245	260	$\mu\text{m}$
Pigtail length with grating	1.5	3		m
Pigtail length without grating	1.0	1.3		m
Minimum bend radius	35			mm
Proof strength	100			kpsi

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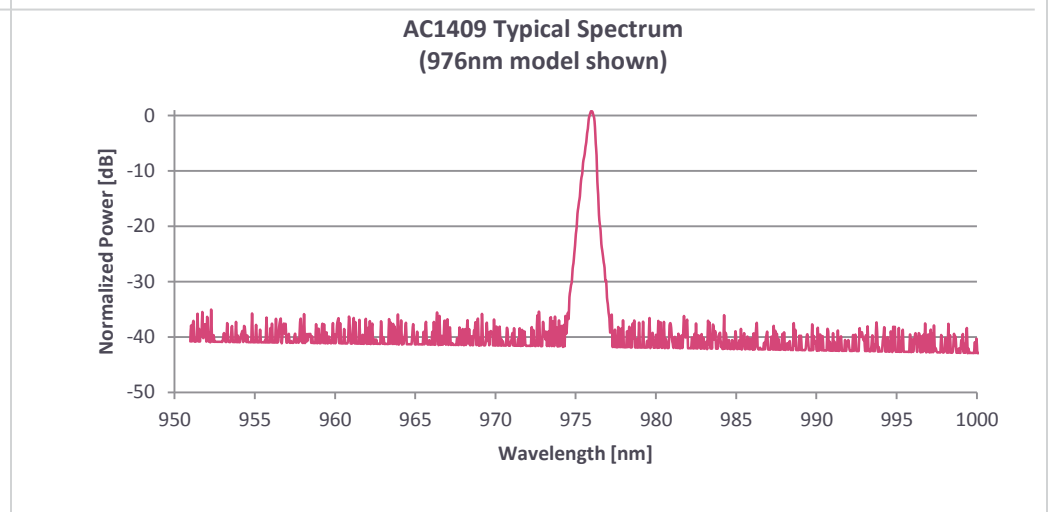
## Typical Operating Characteristics

$T_{OP} = 25^{\circ}C$

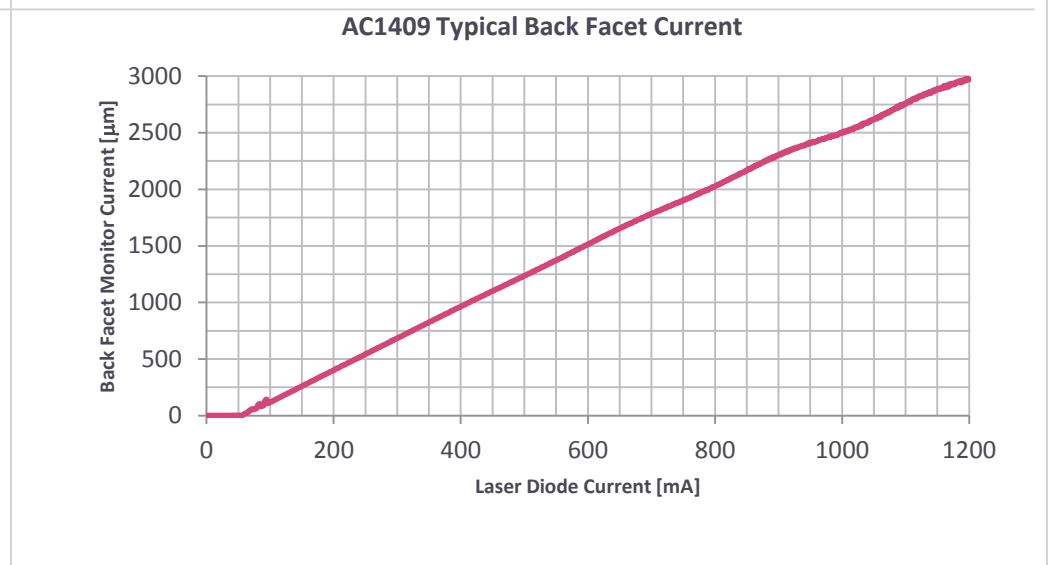
Output power and voltage vs laser diode input current.



Typical spectrum

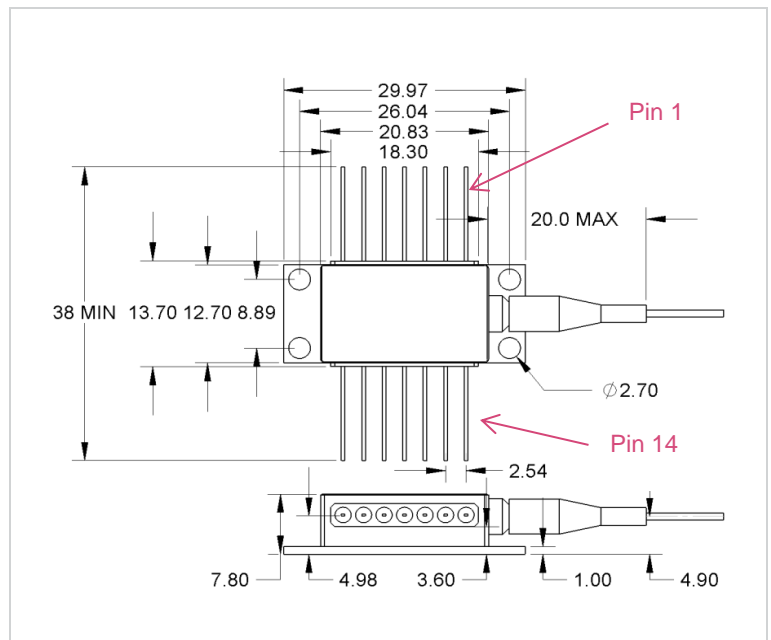


Typical back facet photodiode monitor current vs input current



## Pinout and Mechanical Drawing

Pin	Description	Pin	Description
1	TEC+	14	TEC-
2	Thermistor	13	Case GND
3	Monitor PD anode	12	NC
4	Monitor PD cathode	11	Laser cathode
5	Thermistor	10	Laser anode
6	NC	9	NC
7	NC	8	NC



Absolute Maximum Ratings*	Sym	Min	Max	Unit
Storage temperature	$T_{STG}$	-40	+85	°C
Operating case temperature	$T_{OP}$	-20	+65	°C
Laser forward current	$I_F$		1.2	A
Laser reverse voltage	$V_R$		2.0	V
Photo diode photo current	$I_{PD}$		10	mA
Photo diode reverse voltage	$V_{PD}$		20	V
TEC current	$I_{TEC}$		6.0	A
TEC voltage	$V_{TEC}$		4.0	V
Thermistor current			2	mA
Thermistor voltage			5	V
Lead soldering time			10	s
Lead soldering temperature			250	°C
ESD (human body model)			500	V

\* Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and operation of the device at or beyond these conditions is not implied. Exposure to absolute maximum ratings for extended periods of time may affect device reliability.

## Ordering Information

Example part number: AC1409-0976-0700-PM

Order code

				①		②				③				④		
A	C	1	4	0	9	-					-					

①	Model	Standard													
	Code	AC1409													
②	Kink free power	600 mW							700 mW						
	Code	0600							0700						
③	Wavelength <sup>1</sup>	974 nm				976 nm				980 nm					
	Code	0974				0976				0980					
④	Fiber type	Polarization-maintaining				Single-mode fiber (non PM)				No grating					
	Code	PM				SM (976 only)				00					

<sup>1</sup> Other wavelength options available, contact sales for more information.  
Contact sales if connector required.

### For further information

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E: bostonales@goochandhousego.com

[goochandhousego.com](http://goochandhousego.com)

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