



## 14-Pin 976 nm Butterfly, Industrial-Grade

Alfalight's 976 nm industrial-grade high-power multimode diode lasers are ideal for cladding-pumped EDFAs and DPSS applications. The hermetically-sealed, epoxy-free 14-pin package with integrated thermoelectric cooler allows ease of use through user-controlled temperature tuning.



- Hermetically-sealed package with thermoelectric cooler
- Integrated monitor photodiode
- Up to 4 watts output power

### Device Characteristics\*

AM4-976A-10-403

Electro-Optical	Symbol	Min	Typ	Max	Units
Center wavelength	$\lambda_c$	976 ± 3			nm
Output power	$P_o$	4.0			W
Operating current	$I_o$	5.7	7.0		A
Forward voltage	$V_f$	1.7	1.85		V
Threshold current	$I_{th}$	0.3	0.5		A
Spectral width, FWHM	$\Delta\lambda$	3.5	4.5		nm

### Monitor Photodiode

Detector responsivity	$dI_{pd}/dP_o$	125	625	1250	$\mu\text{A/W}$
Detector reverse bias	$V_r$	0		5	V
Detector dark current	$I_{dc}$		0.1	50	nA

### Thermo-Electric Cooler

Thermistor value at 25°C	$R_{th}$	9.5	10	10.5	k $\Omega$
Thermistor constant, 0 - 50°C	$\beta$	3892			K
Spectral shift with submount temperature		0.3			nm/°C
TEC drive current**	$I_{TEC}$	2.1	4.5		A
TEC drive voltage**	$V_{TEC}$	2.1	4.9		V
Heating/cooling capacity	$\Delta T$	-65		40	°C

### Mechanical

Case operating temperature	T	-40		65	°C
Case storage temperature		-40		85	°C
Fiber core diameter		105			$\mu\text{m}$
Fiber numerical aperture	NA	0.15			N/A
Fiber length		1.0	1.5		m
Fiber pull strength		1.0			kg-f
Module power dissipation**		10.1	17.7		W

\* All conditions are at 25°C submount temperature and output power unless otherwise noted.

\*\* Depends on mounting condition, at  $\Delta T_{Max}$

Absolute Maximum Ratings*	Min	Max	Units
Soldering temperature **		260	°C
Soldering duration**		10	s
Mounting torque		0.10	N-m
Short term fiber bend radius	12.5		mm
LD reverse current		10	mA
LD current transient max.		t=100ns 1000 mA	
LD ESD damage C=100pF, R=1.5kW		HBM > 1000V	
Detector ESD damage C=100pF, R=1.5kW		HBM 500V	
Detector reverse voltage		15	V
Detector forward current		100	mA
Thermistor voltage		5	V
Thermistor current		2	mA
Thermoelectric cooler current		4	A
Thermoelectric cooler voltage		4.5	V

\* These are safe short-term exposure limits, non-operating. Prolonged exposure to conditions at the absolute maximum ratings will have a deleterious effect on reliability and could shorten diode lifetime.

\*\* No point on the package (other than the leads) should exceed the maximum case storage temperature during soldering.

## Package Dimensions

